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Railway Wages

THIS afternoon representatives of the railway management are meeting representatives of the three railway trade unions at the request of the latter to discuss the question of restoring the 5 per cent. deduction from earnings which has been in operation since March, 1931. At the recent annual conferences of the railway unions resolutions were passed urging the leaders to press for the restoration of the cuts, and there is no doubt that the demand has been reinforced by the partial pay restoration recently made by the Government to civil servants. The two cases, of course, are not on all fours, for the national revenues justified the action of the Government, whereas, unfortunately, although railway earnings are showing substantial increases, the net revenue of the companies for 1933 was still nearly £9,000,000 less than the net revenue in 1930 upon which the cuts in railway wages were based. It is too soon yet to make a reliable estimate of what the position of the railway companies will be by the end of this year, but it seems improbable that the 1930 position will be restored by then, and it certainly has not been restored yet. The railway shareholders are therefore perfectly justified in expecting those charged with the administration of their property to resist the restoration of the cuts in the meantime. The position is a difficult one for all parties, for none would be found unwilling to increase rates of pay, whether wages, salaries or dividends, all round if it were possible to do so while at the same time balancing the railway budget. We are irresistibly brought back to the fact to which we have so often drawn attention in the past, namely, that the pool from which personal incomes are drawn is inadequate either to satisfy individual wants or to enable producers to dispose of what they have for sale.

The Importance of the Individual

An interesting contradiction of the present time is that whereas there is a small but disproportionately vociferous body of opinion which extols the virtues of the mass man and despises the individual, there is also more serious attention being paid to the problem of personal welfare among those engaged in large-scale enterprise than ever before. Writing in *Industrial Welfare* of June, Sir Josiah Stamp, Chairman of the L.M.S.R., maintains that, in the case of the staff of a railway, the whole may be either more or less than the sum of its parts, according to the presence or absence of that spirit of friendly rivalry and personal initiative which can flourish only when individuality is allowed to develop. Attached to the organisation of the Chief Officer for Labour and Establishment of the L.M.S.R. is a staff of men and women welfare officers whose duty it is to supervise the wellbeing of the personnel all over the system, and it has been definitely established that healthy and congenial conditions during working hours, coupled with opportunities for social recreation and sport in the period of leisure, contribute to heightened efficiency. It is in harmony with the whole spirit and object of the scheme that employees are not expected to remain the passive recipients of such benefits, but are encouraged to co-operate in safeguarding their own health and happiness.

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The Week's Traffics

The increases shown in merchandise traffics for the past week by three of the group companies are on top of merchandise gains recorded by the L.M.S., L.N.E., and Great Western Companies of £25,000, £8,000, and £8,000 respectively for the corresponding week of 1933, but for that week increases in the total were shown only by the L.M.S.R. and L.N.E.R. For the first 28 weeks of 1934 the aggregate traffics of the four companies are estimated at £77,210,000, an increase of £3,661,000 or 4.95 per cent. in comparison with the corresponding period of 1933. Mersey Railway traffics for the past week showed an increase of £275, bringing the aggregate increase to £5,121.

	28th Week				Inc. or dec.	
	Pass. &c.	Goods, &c.	Coal, &c.	Total.	Year to date	%
L.M.S.R. ..	+ 10,000	+ 17,000	- 8,000	+ 19,000	+ 1,497,000	+ 5.04
L.N.E.R. ..	+ 8,000	+ 2,000	+ 2,000	+ 12,000	+ 1,511,000	+ 7.05
G.W.R. ..	- 3,000	+ 8,000	- 3,000	+ 2,000	+ 398,000	+ 3.20
S.R. ..	+ 15,000	-	- 3,000	+ 12,000	+ 255,000	+ 2.56

Great Northern (Ireland) traffics for the past week were £3,000 better, bringing the aggregate increase up to £150,900. On the Great Southern the increase is £84,326.

* * * *

The Reichsbahn's Sunday Problem

Those responsible for the administration of railways are seldom heard to complain about traffic increases, even though these may occasionally cause them some embarrassment. It has always been symptomatic of the German people that Sunday travelling has a special attraction for them and as a rule the stations and trains are thronged on that day. Nowadays, when every other person in the country is wearing a uniform of some sort or another, and those who are not at least carry one or more badges, the Reichsbahn has to cater every Sunday, not always by prearrangement, for processions each numbering hundreds and in the aggregate thousands of uniformed boys, youths and men, together with paraphernalia consisting of flags and other accoutrements, en route for camping grounds, drilling stations and so forth. The processions march through the streets with flags flying and to the strains of martial music and, as we recently observed at several large centres, the space around the railway station

is for long periods in a state of continual congestion, more and more "troopers" arriving on the heels of those who have already entrained or are endeavouring to do so. Meanwhile large numbers of the ordinary public swarm about the entrances, and long queues are seen endeavouring to secure tickets. The problem cannot be an easy one and, so far as we were able to judge, no special provisions were made by means of extra trains or otherwise to meet the situation.

* * * *

A Seating Essential

More than once we have referred to the importance of providing the utmost possible comfort for railway travellers in order that they may be tempted to come again. Much has been done of recent years, but we think that the companies might go still further without incurring any additional expense, by greater attention to the design of seating, particularly in third class carriages. During the constant progress of rolling stock through the works for repair it is necessary to overhaul, if not always to renew, the upholstery. An example of thoroughness in this respect has recently been provided by the L.P.T.B. in the rejuvenation of the rolling stock for the Inner Circle, where the old Metropolitan penitentiary type of seating has been swept away and replaced by attractive and comfortable seats which probably cost no more than renewals of the old pattern. The main line railways have not been consistent in their policy and far too much badly designed seating has simply been renovated when it might have been remodelled on more comfortable lines. Sometimes, even, the old seating has been replaced by a new design still less comfortable. A very common fault is to make the seats too high and to slope the back so that it thrusts forwards the passenger's shoulder blades but leaves him elsewhere without support. Rectification of this fault is more important than the provision of padding or springing, and were it remedied the gratitude and continued patronage of travellers would be the railways' reward.

* * * *

The Mersey "Miracle"

His Majesty the King was happily inspired when, on opening the Mersey Tunnel on Wednesday afternoon last, he referred to that magnificent undertaking as "this miracle" and thanked all concerned in its accomplishment—"the minds that planned, the skill that fashioned, the will that drove and the strong arms that endured in the bringing of this work to completion." It is, indeed, a miracle of its kind—yet another wonder of the world, in fact—and we are not in the least surprised to learn that among the many felicitous messages which reached the Liverpool authorities from various parts of the world was one from the port of New York affirming that the tunnel is a triumph for British engineering and a magnificent contribution to the useful transportation works of mankind. What the achievement of the miracle will mean to the people of Liverpool and Birkenhead can easily be conjectured by those who are familiar with the transport difficulties of those congested areas. The new tunnel, which has cost about £8,000,000, has a total length of roadway including approaches of 2.87 miles and is believed to be the first of its kind to carry a four-way traffic system, the width between kerbs in the through traffic way being 36 ft. A large amount of time will be saved in the conveyance of merchandise to and from shipholds, for hitherto fast moving road traffic has had to slow down very considerably when approaching the docks. As a contrast traffic can now traverse the tunnel at 20 m.p.h. in 6½ minutes.

Making the Most of the Fine Weather

On a later page herein some interesting particulars will be found relating to the cheap evening trips to certain seaside and country districts arranged by the London & North Eastern Railway. So popular have these trips become both in England and in Scotland that the all-line total of schedules is now, we understand, in the neighbourhood of 150. The idea, of course, is to give those residing in thickly populated districts an opportunity to make the most of the fine weather and to get a breath of fresh air. These "fine weather trains," as they are popularly termed, usually leave between 5 and 6 o'clock in the evening, reaching their destinations an hour later and returning between 10.30 and 11 p.m., the fares ranging from 9d. to 2s. return. Appreciating the fact that it is "quicker by rail" (and undeniably much safer), large numbers of people have readily availed themselves of the opportunity to get away from town for an hour or two, to their great content. Extra trains are run when possible if the need arises; but on the other hand, the trips are cancelled in the event of the weather becoming cold or wet. How greatly these trips are appreciated will be gathered from the fact that one Sunday evening recently six trains were run from Liverpool Street, Wood Street, and Ilford to Southend-on-Sea carrying 4,349 people, while an experimental half-crown evening trip from Sheffield to Cleethorpes the same day resulted in no fewer than 5,000 people making the journey.

* * * *

Paulista Railway

Notwithstanding the long-continued crisis, the Paulista Railway Company of Brazil has maintained a strong financial position. Though its net receipts for the year 1933 were less than for 1932, when there were special payments accruing from coffee retained in regulating warehouses, they were decidedly better than in 1930 and 1931, and even showed a slight improvement over 1929, the year before the economic crisis. The length of line operated in 1933 was 1,466 km., of which 44 km. are double track, and three gauges are utilised, 1.60 metre (5 ft. 3 in.), 1 metre, and 0.60 metre. Of the 699 km. of broad gauge line 285 km. are electrically operated. About 700 km. are metre gauge. Negotiations, in conjunction with the Government of the State of São Paulo, are proceeding as to a project of leasing the E. F. Noroeste system (owned and worked by the Federal Government) to the Paulista Company, and a favourable outcome seems probable. Traffics for the current year are improving, but the company has had to grant an increase of wages since May to meet the higher cost of living. The accompanying table compares some operating figures for the past two years. One conto is equivalent to 1,000 milreis, the par value of the milreis being 5.90d.

	1933	1932
Passenger journeys	3,268,435	3,008,879
Goods (tons)	774,473	1,114,801
Gross receipts (contos)	93,729	103,740
Expenditure (contos)	53,850	52,655
Net receipts (contos)	39,879	51,085

* * * *

Solving the Language Problem

The proceedings at the 24th Congress of the International Union of Tramways, Light Railways, and Public Motor Transport Undertakings, held in Berlin from July 1 to July 5, a picture of which appears on page 116, were greatly facilitated by the special telephone equipment sup-

plied by Siemens & Halske for the use of the interpreters. Telephone head sets were provided for each person, together with a selector switch to enable him to connect on to the interpreter speaking the language he wished to hear, illuminated indicators showing what languages were being spoken at a given moment. In this way the speeches were interpreted while they were being delivered, with consequent saving of time. If the papers and any intended discussion are given to the interpreters a reasonable time before the meeting, in such cases they can familiarise themselves with the subject beforehand and are thus able to do the translation work at the microphone rapidly and with general satisfaction to all concerned, in spite of the technical nature of the discussions. The ease with which the system could be worked under these conditions was astonishing. It is a much better method than the old way of translating each speech after it has been delivered. The papers at the Congress covered, with special reference to tramways, light railways and road vehicles, the use of light alloys, regenerative braking, level crossing warnings, permanent way, diesel and accumulator cars, as well as radio interference. The City of Berlin entertained the visitors in the most hospitable manner, and, not to be behind the Prussian capital, Munich invited them to go there for two days more.

* * * *

U.S. Railway Improvement

Following a period when unprecedented loans from public funds alone saved them from an epidemic of receiverships, railways in the United States are gradually showing signs of financial recovery according to *The Index*, published by the New York Trust Company. Altogether more than £100,000,000 has been advanced from public funds during the depression to keep some of the principal lines solvent or to assist them in meeting bare maintenance costs, and at least another £50,000,000 may still be required for the same purposes. Between 1929 and 1932 the total volume of all traffic carried over the principal systems declined by more than a half. Last year, however, net operating income showed an increase of 45.4 per cent. over that of 1932, and so far this year freight revenues are substantially better than in 1933. Competition from rival transportation facilities—automobiles, lorries, aeroplanes, inland waterways and pipe lines—has grown during the depression. To meet it the railways are reducing rates and offering various attractions such as quicker services, air-conditioned passenger coaches, better sleeping and dining cars and so on. An important development is that of the light-weight, streamlined trains such as the Burlington Zephyr, for high speed services.

* * * *

Collision with a Motor Tractor

On Friday, July 13, an express passenger train ran into a tractor and grass-cutter at a level crossing—presumably an occupation crossing—at Pleasington, between Preston and Blackburn, L.M.S.R. In view of the outcry raised in certain sections of the press when accidents occur at level crossings, it would appear desirable, in the interests of the railways and of the travelling public, that the Ministry of Transport should take some public action in this particular incident. There is the important point that railway companies are not responsible for the use made of occupation crossings and, in this specific case, there arises the question as to what is a motor tractor. It is important to know that the rule book makes no distinction between motor vehicles—as generally understood—and horse-drawn vehicles, but there is a reference in Rule 107 (b) to "traction or other heavy engines, or heavy vehicles, whether mechanically propelled or otherwise." Before these pass over the line

at occupation crossings reasonable notice must be given to the nearest stationmaster. The fear thus implied is indicated in the second paragraph of Rule 107 (c), namely that "such engine or vehicle is liable to be held up and so obstruct the line." No one would claim that such a motor tractor as that used on the occasion now under notice would call for the special protection anticipated in Rule 107, but these tractors are capable of drawing vehicles of awkward dimensions. What, however, is more in our mind is the wider question of the risk run of a train being derailed as a consequence of a collision with a motor vehicle. The serious results that followed the collision between an express and a motor vehicle at Shepreth on August 17, 1928, will ever be evidence of what may happen.

* * * *

Brake Developments in Denmark

An important decision in regard to continuous brakes has just been reached in Denmark. Hitherto the vacuum brake has been used on all the Danish passenger rolling stock, but with the exception of a few wagons carrying perishable freight, goods wagons have been provided with hand-brakes only. A considerable interchange of freight traffic takes place, by way of the train-ferries, with the neighbouring countries of Germany and Sweden, and in order to expedite these important freight services, the administration of the Danish State Railways has reached a decision to apply the continuous brake to all its freight rolling stock. As compressed air braking systems are in use in both Germany and Sweden, compressed air brakes are to be adopted in Denmark, and the wagons will be fitted in the proportion of one-third with complete braking equipment to two-thirds provided with through brake-pipes only. This arrangement would, however, have brought into use two different systems of braking in Denmark, vacuum on the coaching stock as compared with compressed air on the freight stock; and for the sake of uniformity it has therefore been decided to convert all the passenger stock to compressed air braking. At present the maximum permissible speed of freight trains in Denmark, with hand-brakes only, is 25 m.p.h., but it is hoped to raise this figure considerably when the equipping of the freight stock is complete.

* * * *

Alternative Methods of Relaying

On another page of this issue is published an article describing a method adopted in the North Eastern Area of the L.N.E.R. for relaying complete lengths of track by means of cranes. This particular method is designed for a four-track road with heavy traffic which cannot be interrupted for any length of time, and leaves two tracks free, one each for up and down traffic, except when shunting movements are being carried out by the relaying train engines over the nearest crossover road. In a paper read before the Sheffield Section of the Permanent Way Institution, and reported in the April, 1934, issue of the *Permanent Way Institution Journal*, Mr. Bassindale described a system of relaying by cranes on a double-line railway, with, presumably, much lighter traffic, as both lines are of necessity blocked throughout the time relaying is in hand. Both schemes are ingenious, and should prove especially useful for relaying on curves, as of course the Morris track-layer can be used only on straights or on curves of very large radius. It would be interesting if the cost of relaying sections of line with varying densities of traffic by the ordinary manual method, by tracklayer and by cranes, could be compared with a view to reducing to a minimum this very heavy item of permanent way expenditure.

Railway Wooing of the Mistress Art

WHATEVER hold the cult of concrete starkness may have upon our readers they will not, we imagine, grudge a word of praise for the new station buildings on the York-Northallerton widening of the L.N.E.R. Idioms of architectural directness may be expressed in terms of brickwork as well as in concrete, and the clear air of Yorkshire has not blown away all love of warm texture from the general breast of the L.N.E.R. architectural staff. We do not hesitate to reproduce again on pages 111 to 113 some photographs of these stations, accompanied by a more detailed description than we gave before in our engineering survey of the widening, for stations touch us closely, whether we are engineers, architects, or merely members of the travelling public, and if those stations please our artful eyes we shall frequent them with more pleasure and perhaps more often. Mr. John Miller in the north, and Mr. Charles J. Brown in the south,* have seized their opportunities of reconstruction and have set an example of L.N.E.R. architectural design which augurs well for the style of stations yet to come. Light and air are admitted freely to the apartments of these new buildings and by contrast show up the drabness and the inclosure of the old. With commending interest shall we watch this progressive lifting of the railway station gloom.

Our present and previous descriptions of the L.N.E.R. widening between York and Northallerton do not by any means exhaust all that is being done to raise the standard of decoration and comfort at the stations in the North Eastern Area. Naturally, all the stations cannot be pulled down at the same time and rebuilt, but where increased traffic calls for better facilities—as, for instance, at Darlington—then the improvement is carried out according to the higher standard now happily prevailing in railway building works. Thus at Newcastle the alterations include an attractive buffet tea-room, panelled in walnut, with an up-to-date entrance from the street flanked by an enticing display window. Everywhere in the area the track and environs have been made neat and tidy; in the somewhat depressingly industrial region of Tyneside bright colours help to banish dreariness; station walls have been painted in light tints, and Nature's own gay products grow in pots and hanging baskets, or climb about the walls. The cheerful effect of these improvements is obvious when a newly painted station is compared with one not yet taken in hand, and it all goes to prove that in the Tyneside area old king Coal can be a merry old soul.

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The Paris-Orleans Railway in 1933

THIS company holds the keys of the international routes between Paris and Spain by means of its connections with the Midi system at Bordeaux and Montauban, and it also serves Tours and the Loire chateaux region and Brittany, so that it has an important and well diversified passenger traffic. A large agricultural traffic is carried and wines provide a considerable revenue. Four tracks are laid along the main line between Paris (Austerlitz) and Etampes, 33½ miles and three on the 18½-mile stretch between Toury and Les Aubrais. Throughout 1933 electric traction was in operation from Paris to Orleans, from Orleans to Vierzon and from Bretigny to Dourdon. The extension of electrification from Orleans to Tours was brought into use in the second half of the year, and the work of electrification between Vierzon and Brive is still being

actively pursued. Electric train-kilometres run in 1933 were 10, 171, 966, or 17 per cent. of the train-kilometres for the whole system. Among the principal works completed during 1933 have been the locomotive testing plant at Vitry-sur-Seine for the use of all the railway systems, and the installation of automatic colour light signalling between Les Aubrais and St. Pierre des Corps including a complete power installation at Tours. There is now continuous automatic signalling between Paris and Tours, a distance of 148 miles, all colour light except for the 54 miles between Bretigny and Les Aubrais. Between Tours and Nantes works of protection against slips have been continued, and plans for the elimination of level crossings in Nantes are well advanced. Increasing success has been shown on the main lines beyond Tours by the rebuilt Pacific locomotives, and remarkable results have been achieved from the rebuilding of one of the earliest Pacifics as a 4-8-0 on the heavily-graded line to Toulouse. The popularity of buffet cars, which were first introduced in 1932, continues, and more of these and of second-class coachettes are being put into service.

From the report for 1933 it is clear that traffics were again seriously affected by the financial crisis and road competition. In passenger numbers there was a fall of 8.12 per cent. and in passenger receipts of 4.45 per cent. in comparison with 1932. New accelerations, new fare concessions, and easier conditions of admission to express trains have done something to mitigate the adverse circumstances. The respective passenger percentages of the total in 1933 were:—first class 0.79 in numbers and 6.12 in receipts; second class 6.08 and 18.14; and third class 93.13 and 75.74. Grande vitesse receipts were down 11.53 per cent., and petite vitesse goods declined 5.25 per cent. in tonnage and 3.37 per cent. in receipts. In petite vitesse traffics the most serious handicaps were the lessened consignment of grain, in spite of a good harvest, and the difficulties of the wine market. Numerous tariff reductions, an increase in the weight and size allowed for express parcels, rates per wagon and door-to-door transport have been among the inducements offered to traders, but the slowness of the necessary legal procedure has too often prevented their sanction in time to be of real use. This should, however, be remedied under the new procedure which came into force in 1934. Traffic receipts in 1933 as a whole were less by fr. 93,930,266, or 5.43 per cent. than in 1932. The operating figures given in the accompanying table include those charged to *compte d'établissement* relating to the lines from Villeneuve-sur-Lot to Falgueryat and from Montluçon to Gouttieres.

	1933	1932
Kilometres open	7,878	7,878
Passengers, number	69,139,999	75,253,064
Petite vitesse goods, tons	21,898,050	23,110,709
Train kilometres	59,596,862	62,632,729
Operating ratio per cent.	91.85	92.61
	Francs	Francs
Passenger receipts	404,826,489	423,696,523
Grande vitesse	275,996,760	311,984,711
Petite vitesse, goods	906,936,288	938,532,775
Total receipts	1,665,266,897	1,744,571,756
Total expenses	1,533,804,408	1,612,605,959
Net receipts	131,382,489	131,965,797

Fruitful economies have continued to be exercised in many directions, e.g. by the use of one station for both Orleans and Etat trains, instead of two, at Angonleme, the closing of dépôts at Coutras, Saumur, and three other places, and the institution of traffic control between Limoges and Montauban. The complete working union with the Midi Railway becomes operative this year. The dividend is 62 fr.

* The new stations on the Shenfield widening, carried out by Mr. Brown, were illustrated and described in THE RAILWAY GAZETTE of January 19 last.

Midi Railway of France

AT Bordeaux, the Midi system meets the Orleans Railway and continues, via Dax, to the Spanish frontier on the west. It also links up with that frontier on the east at Port Bou, and has two other trans-pyrenean connections. The west-to-east main line runs from Bordeaux via Toulouse and Carcassonne to Sète, where it meets the P.L.M., and it also connects with the Orleans Railway and the centre of France via Montauban. With the Orleans company the Midi has always had many interests in common, and a complete working union between the two systems has become operative from the beginning of 1934. For 1933 each company has a separate report. The length of line worked by the Midi in 1933 was 4,290 km., the same as in the preceding year. The length of line worked electrically remained at 1,490 km., of which 619 km. were double track. Electrification of the 103 km. section from Bordeaux to Pointe-de-Grave is being completed this summer, and it is expected that early in 1935 electric working will be in operation on the 70 km. between Narbonne and Sète. The work of electrification on the 200 km. Montauban-Narbonne is also being actively proceeded with.

A further decrease in receipts was shown in 1933, amounting to 10 per cent. in comparison with 1932. Grande vitesse receipts, which had hitherto held up the best, were the most affected, but there was some slackening in the rate of decrease in the case of passenger and petite vitesse earnings. At the same time, while traffic receipts have fallen by fr. 80,833,888 or 10.19 per cent., working expenses have been reduced by fr. 48,947,044 or 6 per cent. The loss on working has been increased, and the final result of the year's operations is a deficit of fr. 378,655,337 chargeable to the Common Fund, as against fr. 329,672,989 in 1932. The dividend is reduced from 53.50 fr. to 50 fr. on each 500 fr. share. Some operating results are compared in the following table:—

	1933	1932
Passengers	21,131,173	23,704,554
Tons (p.v. goods)	11,377,963	13,182,899
Average p.v. haul (km.)	147.8	131.9
Train-kilometres	32,618,907	32,545,712
Operating ratio, per cent.	107.6	102.6
	France	France
Passenger receipts	170,906,679	177,188,813
Grande vitesse	102,467,835	117,570,312
Petite vitesse	438,613,137	483,917,671
Total receipts	735,409,163	818,697,080
Total expenses	791,363,624	840,310,669
Loss on working	55,954,461	21,613,589

Though the number of passengers declined 10.8 per cent., the fall in passenger receipts was only 3.5 per cent. This was largely due to the fact that road competition affected mainly the short distance journeys, the average passenger journey by rail increasing from 60 km. to 64.9 km. In excursion and pilgrimage traffics there was an appreciable increase. Third class receipts in 1933 provided 74.5 per cent., second class 18.7 per cent., and first class 7 per cent. of the total passenger receipts, these proportions showing little variation from 1932 except for a slight increase in second class at the expense of the two other classes. Against a general set-back in grande vitesse traffics there were substantial increases in *colis agricoles* and *colis express*. Total petite vitesse tonnage showed a decrease of 13.67 per cent., and receipts a decrease of 11.7 per cent. Road competition was mainly in short and medium distance traffic, and the average haul by rail increased. Wine traffic suffered to the extent of 16.5 per cent. from the bad harvest of 1932, and from the competition of tank lorries. Lorries also competed actively for the carriage of live pigs, lambs, and calves. There was a drop of 29.2 per cent. in the carriage of cereals,

flour and potatoes, and of 25.3 per cent. in building materials. Numerous tariff modifications have again been introduced, as well as new wagon-kilometre rates in conjunction with the other railways. Since March 1, 1933, all goods trains have been fitted with continuous brakes. The employment of railcars in complete substitution for passenger trains since August 1, 1933, on the section between Marmande and Mont-de-Marsan has resulted in an increase of 7 per cent. in the number of passengers. Since January 1, 1934, railcar services have been run between Dax and Mont-de-Marsan and between Saint Sever and Hagetmau. A trial is to be made of express railcar services between Perpignan and Montpellier, where road competition is intense.

* * * *

Colonel Mount's Annual Report

ONCE again the Chief Inspecting Officer of Railways has placed in the hands of the administrators of British railways an eloquent testimony to the care with which they perform their duties in regard to the safety of the travelling public. The figures contained in the annual accident report for 1933, issued on Tuesday last, must be very gratifying to railway people, but it is to be feared that the public, now so accustomed to what the Minister of Transport himself has called the "mass murder" on the road, scarcely appreciates the care exercised over them when on the rail. The term "negligible" is not sufficiently refined to apply to the minute risk incurred by railway passengers. There were nearly 412 million miles run by trains last year and, in the passenger trains, 1,575 million journeys were made. Yet there were only two train accidents in which passengers lost their lives, equivalent to one fatality to some 262 million journeys. It is to be regretted that the fatal accidents—eleven—to railway servants in train accidents were higher than usual, but two of these were not train accidents as generally understood, two were by the landslide of railway property at Fairbourne, whilst dense fogs accounted for another three deaths. So that of only three accidents, involving four fatalities, could it reasonably be said that they were avoidable. In "movement" accidents, other than train accidents, the fatal cases—152—among railway servants were slightly higher than the 146 in 1931 but lower than the figure for 1932 and than the average for the ten-year period, 1920-1929. The last comparison implies that, except for 1931, last year gave the best result ever recorded of the fatalities to railway servants in "movement" accidents.

The number of train accidents that called for inquiry by the inspecting officers in 1932 was only eight. There were 18 last year, which was a big increase over 1932, and was higher than the 15 of 1931 and the 13 of 1930. The total number of inquiries last year was, however, lower than in any other year prior to 1930, except the 17 of 1927 and in the war period. The lessons to be learned from some of the more important inquiries of last year are briefly mentioned by Colonel Mount. Actually, there were 19 inquiries held, but one referring to the injury to a servant when a passenger train ran into a platform truck he was taking across the line, was not the subject of a report. Of these 59 accidents, 17 were collisions, in all of which, except one, passenger trains were involved. Six collisions were due to failure of enginemen to obey or observe "danger" signals; three to failure of enginemen to comply with speed restrictions or misjudgment of brake manipulations; three to failure of signalmen to obey or give effect to regulations and two to failures of guards to observe regulations. In 14 of the 19 cases inquired into the inspecting officer concerned made recommendations; in six cases these have been adopted and in three not adopted, whilst the remaining five cases were still under consideration when the

report was prepared. Many other train accidents, which were not formally inquired into, were dealt with by correspondence with satisfactory results. Five of the accidents inquired into might probably have been avoided by automatic train control, and that was so in another ten train accidents into which inquiries were not held.

Of the Raynes Park accident—THE RAILWAY GAZETTE, October 20—it is observed by Colonel Mount that although the circumstances were exceptional, having regard to the careful selection of all supervisory personnel in charge of track maintenance, the recommendation to amplify general rule 224 was adopted by the companies, viz., that where the extent of a lift, the density of traffic and other conditions render it necessary, a speed restriction will be imposed in future. At Three Bridges and Alne—our issues of August 18 and April 13 respectively—and in two other cases not inquired into, collisions occurred under the stop-and-proceed rule at colour light signals. It is remarked that in all four cases it is possible that the use of more brilliant tail-light might have had preventive effect. In the discussions which have taken place, and which are making satisfactory progress, full consideration is being given to the practicability of additional safeguard-

ing measures in the operation of the rule, the applicability of which has been extended of late in view of the wider use of automatic signals. A very useful addition has been made in the present report. Hitherto it has not been the practice to report the subsequent history of any recommendation still under consideration when the report for the year concerned was prepared. The report now before us reverts, for instance, to the Dagenham Dock collision in 1931—THE RAILWAY GAZETTE of September 30, 1932—in order to record that the decisions, applicable alike to railway-owned and privately-owned wagons, arrived at after discussions between the railway companies and the Private Wagon Owners' Association, with regard to the strengthening of drawgear, provide for new draw-hooks and bars being made without welds, from steel of 32-38 tons per square inch tensile, and that, as from June 30, the repairing of mild steel draw-hooks and bars by welding will not be permitted. The Great Bridgeford report of 1932—THE RAILWAY GAZETTE of June 9, 1933—is also revived in order to say that the companies are issuing a special instruction, for general application at junctions and other diverging points, similar to that already in force on one system, to the effect that the moving of facing points will be prohibited unless the signalman is satisfied, where practicable, that it is safe for him to act having regard to the position and speed of the approaching train.

Beyond saying that there was a decrease in the number of failures of axles of all descriptions, of couplings of all descriptions, and of broken rails, we will leave until another occasion the consideration of the accidents to, or failures of, rolling stock or permanent way. We must also leave over our comments on the gratifying reduction in the number of accidents to railway servants. Our remaining space should, we consider, be devoted to the question of accidents at level crossings. From the penultimate paragraph in the conclusion to the present

report it is said that there are approximately 5,000 public-road level crossings, with and without gates, over the railways of this country. No corresponding figures are given as to occupation crossings and footpath crossings, but that, in a sense, is immaterial, as the railway companies have no specific responsibility placed upon them by legislation for safeguarding the movement of road vehicles or pedestrians over them. It is only public-road crossings that have to be protected. There were 140 cases of accidents at public-road crossings, in 122 of which there was only damage to the gates or to the road vehicle. In 18 cases there were, however, personal casualties, in which 8 persons were killed and 17 injured. On investigation it was found that of the 18 accidents, 8 were due to lack of proper caution of pedestrians, 8 to lack of proper caution by the drivers of road vehicles, in 2 the trainmen were in fault; but in no case was the gatekeeper or signalman concerned to blame. Moreover, of the eight killed, only one was the occupant of a road vehicle, six were pedestrians, and one was a railway servant.

The summary, originated in the 1931 report, is repeated in the present report. It is as shown in the following table:—

Particulars	Annual Average, 1920-24		Annual Average, 1925-29		Year 1931		Year 1932		Year 1933	
Accidents to trains.. ..	1,009		941		831		739		760	
Accidents to or failure of rolling stock or permanent way	11,153		9,141		6,342		5,381		5,156	
Casualties:—	<i>K.</i>	<i>I.</i>	<i>K.</i>	<i>I.</i>	<i>K.</i>	<i>I.</i>	<i>K.</i>	<i>I.</i>	<i>K.</i>	<i>I.</i>
Passengers	92	2,577	91	3,733	71	4,111	77	4,044	70	4,716
Servants	248	3,518	210	3,267	159	2,714	170	2,385	163	2,487
Other persons	67	136	67	158	59	161	60	130	49	145
Totals	407	6,231	368	7,158	289	6,986	307	6,559	282	7,348
Passenger journeys, including estimates of those of season ticket holders (millions) ..	1,848		1,661		1,606.2		1,557.0		1,574.6	
Freight tonnage (millions)	322		320		289		269		269	
Net ton-miles (millions) ..	17,457		17,562		16,322		14,942		15,026	
Servants employed (March)	707,574		680,197		616,919		599,290		567,554	
Passenger and freight train mileage (millions)	368.7		401.3		411.7		405.2		411.8	
All casualties per million train miles:—										
Killed	1.1		0.9		0.7		0.8		0.7	
Injured	17		18		17		16		18	

In this table, which shows the total of casualties resulting from *all movements on rail*, to passengers, servants, and other persons, which were reported during the specified periods, it should be noted that cases of trespass and suicide, or attempted suicide, have been omitted. The first horizontal column or Class I, relates to accidents to trains and to failures of rolling stock, permanent way, &c.; the second horizontal column (Class II) to those accidents which are caused by, or connected with, the movement of railway vehicles, exclusive of accidents in Class I. Only casualties included in these two classes can reasonably be taken into account for comparative purposes. As Colonel Mount observes in his concluding remarks, train-mileage affords a reasonable basis on which to base the general incidence of accident and casualty. He draws attention, therefore, to the information in the last lines in the above table as illustrating the high standard of safety which was fully maintained during 1933.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Some Indian Signal Statistics

Great Indian Peninsula Railway
Signal and Interlocking Engineer's Office,
81, Victoria Terminus, Bombay.

July 9

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have just read with much interest your editorial on the above subject in your issue for May 18 in regard to Mr. Smyth's paper, but would point out that some of Mr. Smyth's statements are now out-of-date. His paper was written, I think, some time back; at least, the information supplied to him regarding the practice of this railway was sent as long ago as December, 1930. Much has happened since then.

Yellow arms and lights were adopted for all warners on separate posts, in place of the well-known Indian practice of a fixed green light above a red arm and light, throughout our Bombay suburban area in February, 1933.

There is another point: Mr. Smyth refers to the reasons through which we were obliged to adopt two-aspect colour light signalling instead of the three-aspect which other railways in India were subsequently able to adopt. It will therefore be interesting to mention that all our two-aspect colour light signalling has now been changed over to three-aspect, and the work was completed in March of this year.

Yours truly,

H. E. COX,

(Official Signal and Interlocking Engineer)

Irish Free State Railways and Coal

Great Western Railway,
Chief Goods Manager's Office,
Paddington Station, W.2.

July 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—With reference to the editorial note with regard to Irish coal on page 3 of your issue of July 6, I would like to mention as a point of interest that, in addition to the Arigna coalfields, there are, I believe, also anthracite deposits worked at Deer Park Colliery, Castlecomer, on the Great Southern and Western Section of the Great Southern Railways between Portarlinton and Waterford, the colliery being served by a branch from Castlecomer junction, near Kilkenny.

It is also mentioned in the article that in connection with the re-conditioning of three 2-4-2 tank locomotives, that passenger traffic has now ceased on the Cork, Blackrock and Passage Railway Section of the Great Southern Railways. I would here remark that this line has been entirely abandoned and the rails removed, the goods service being, I believe, maintained by road vehicles.

Yours faithfully,

P. R. GALE

[The closing of the Cork, Blackrock and Passage Railway on Monday, September 19, 1932, was recorded in our columns at that time (see R.G., September 16, page 353, and September 23, page 381). The line was opened in 1850 and converted in 1900 from 5 ft. 3 in. to 3 ft. gauge.]

PUBLICATIONS RECEIVED

Transactions of World Power Conference Sectional Meeting, Stockholm, 1933. Seven Volumes. London:

Percy Lund, Humphries & Co. Ltd., 12, Bedford Square, W.C.1. 9½ in. × 6 in. About 4,000 pages. Price £8 15s. the set.—This sectional meeting of the World Power Conference was convened to consider economic power supply for large-scale industry and transport, the latter being dealt with in Vols. 6 and 7. Vol. 1 is a general chronicle of the meeting and includes a general index. Vol. 2 is concerned with electric power supply, and particularly with problems arising from co-operation between different sources of supply. Solid, liquid and gaseous fuels are discussed in Vol. 3, while Vol. 4 covers power and heat combinations. Miscellaneous subjects are treated in Vol. 5, including problems of the iron and steel industry, electric furnaces and other electrical equipment. Vol. 6 is concerned almost wholly with railway topics, and is obtainable separately, price 55s. (800 pages). Much of the material compares steam, diesel, and electric traction, in the light of recent experience on the Continent and in America. The relationship between tramways and omnibuses is debated, and such questions as power economy, design, transmission of power, operation of producer gas, and electrically-driven motor vehicles form the subjects of papers or communications. Vol. 7 relates to marine transport. The

various papers are printed in the language in which they were presented—usually English, German, or French—and have summaries in at least two other languages.

Silver Fox Stainless Steels.—

Samuel Fox & Co. Ltd. sends a catalogue of the 11 grades of Silver Fox stainless steels. A foreword summarises the qualities of the steels, which may be divided into two groups, hardenable and non-hardenable. The descriptions of each grade include notes on its uses and particulars of heat treatment and mechanical properties. The catalogue concludes with instructions for soldering, brazing and welding the steels. It is sent in a stiff-backed binder with an ornament in Silver Fox 20 stainless steel on the cover.

Railway Rolling Stock and Constructional Work.—

From the Compagnie Centrale de Construction, Haine-Saint-Pierre, Belgium, we have received a copy of its latest catalogue, which contains 142 pages, each alternate one carrying a photographic illustration of one or other of the products of the company. These include railway passenger and freight vehicles of various types, built and supplied to railways in many different parts of the world, bridges, cranes, railway stations, points and crossings, river and canal locks and other forms of construction used in connection with railways and ship-

ping. The company also builds locomotive tenders, wheels and axles, and other units employed in the construction of locomotives and coaching and wagon stock. Some of the earlier pages in the catalogue are devoted to reproductions of illustrations of the company's workshops at Haine-Saint-Pierre. The catalogue is printed in four different languages, namely, French, English, Spanish, and Portuguese. It is bound in limp covers of an attractive shade of brown, with aluminium and gold relief.

Edgar Allen Steels and Trackwork.—

Three attractive new folders dealing with the products of Edgar Allen & Co. Ltd., Sheffield, have lately made their appearance. That dealing with Maxilvry Imperial stainless steels have a cleverly designed cover combining silver and blue, and opens to show illustrations of components and castings carried out in the metal appearing on a silvered ground. The ten qualities of the steel are listed, with their applications, and mention is made of two booklets dealing with the subject in greater detail. The high polish that can be taken by Maxilvry stainless steel is demonstrated in a novel manner. The second folder deals with Stag Major high speed steels. The Stag Special and Stag Extra Special grades have found widespread and successful application in tools for turning locomotive tyres. The trackwork folder shows layouts carried out in ordinary, manganese and other alloy steels. The firm makes a speciality of permanent way problems.

THE SCRAP HEAP

CONSERVATION OF ENERGY

During the run of a new oil engine in Ireland recently the General Manager explained that the exhaust was so designed that the fumes should kill the weeds in the permanent way.—*Mr. W. V. Wood, Vice-President, L.M.S.R. at the Jubilee Dinner of the Permanent Way Institution.*

A crowd of people seeing friends off on the Liverpool boat train at Euston the other evening, were surprised to see a man clinging to the front of the small tank engine which followed the express out of the platform. He had, it was learned, been to buy some cigarettes, leaving his coat and luggage in his compartment. During his absence the train had started, and he was making a desperate effort to catch it by climbing on to the tank engine, hoping to jump across on to the train from there. After failing to accomplish the reckless act, he was accompanied off the platform by irate officials.

BUFFET CAR MENU

The following is the menu of the new G.W.R. buffet cars, introduced on the G.W.R. on July 9, which were described and illustrated in our issues of June 6 and 13:—

Hors d'Œuvre

Grape Fruit	.. ..	per portion	6d.
Cantaloupe ..	.. ..	..	8d.
Various ..	.. ..	..	1/-
Smoked Salmon	.. ..	..	1/6

Cold

Salmon ..	.. ..	per portion	1/6
Salmon Mayonnaise	.. ..	..	1/9
Lobster (Half) ..	.. ..	..	2/9
Wing of Chicken and Ham	.. ..	..	2/-
Leg of Chicken and Ham ..	.. ..	..	1/9
Galantine of Chicken ..	.. ..	per portion	1/6
Veal and Ham Pie ..	.. ..	..	1/3
Ham ..	.. ..	..	1/-
Roast Beef ..	.. ..	..	1/-
Ox Tongue ..	.. ..	..	1/-
Pressed Beef ..	.. ..	..	1/-
Lamb ..	.. ..	..	1/3
Assorted Meats ..	.. ..	..	1/3
Sausage Rolls ..	.. ..	each	4d.
Sardines (2) on Toast ..	.. ..	..	6d.

A LUCKY RAILWAYMAN

Among the passengers who arrived on Tuesday from Buenos Aires on the Royal Mail liner *Alcantara*, was Mr. Arthur Page, a member of the staff of the Accountant's Department of the Buenos Ayres Western Railway. Mr. Page is the fortunate holder of one of the "Windsor Lad" tickets, which won a £30,000 prize in the Irish Hospitals Derby sweepstake, and comes to England to collect the proceeds of his profitable ten shilling investment. Once it became known in Buenos Aires that Mr. Page had won a first prize in the Derby "sweep," he had literally to disappear in order to avoid the avalanche of people anxious to share his good fortune. Their house in a Buenos

Aires suburb was besieged with would-be callers and every post brought hundreds of begging letters, while threats that he or his wife and child would be kidnapped were also alarming. They got away safely to friends in the neighbourhood of Rosario with whom they stayed until the departure of the *Alcantara* to England.

This is not the first occasion that a member of the staff of the Argentine railways has been favoured with one of the big prizes in the Irish sweepstake, as Mr. C. Gould, a draughtsman in the employment of the Central Argentine Railway at the Gorton workshops, Perez, won a third prize worth £10,000 in the last drawing in 1933.

Charlie Murphy, one of America's famous amateur cyclists a generation ago, had a theory that a man could keep up with a train speeding at 60 m.p.h. if the wind resistance were broken for him. Boards were laid down for three miles between a railway track on Long Island, and a hood and side shields were fitted to a railway coach, projecting for 11 ft. 4 in., inside which protecting sheath Charlie was to ride. The train started and Charlie started; both of them picked up speed, and still he clung behind until 60 miles per hour was reached. He had done it; his record was a mile in 57 4-5 seconds. Charlie described the finish, in a written account, thus:—"The locomotive slowed too suddenly; on I came, and crashed head on into the rear of the train. The front wheel recoiled while the back wheel rebounded and continued to revolve in the air. I pitched head forward. A frantic yell of despair went up from the officials on the rear platform. . . . I reached forward, grabbed an upright on the rear of the car. . . . I was on the platform but a few seconds when the train dashed over the end

of the boards that were laid between the rails. "I remained speechless on my back, ashen in colour and sore all over from the hot cinders and rubber that came from under the car."—*From "The Evening Standard."*

First Lady Passenger: "Cologne at last; thank goodness; I've had enough of this travelling."

Second Lady Passenger: "It says 'Köln' on the platform."

First Lady Passenger: "Oh dear, oh dear, I was so hoping we were done with it."

LEAVEN FOR THE LUMP

On the railways and in the railway shops there are almost exactly 517,000 male persons employed. Dividing this number by the 20,400 miles of lines open for traffic, we get 25.3 male persons per mile of railway. If distributed along these 20,400 miles there would be a man every 70 yards and in addition there is a female staff sufficient to provide a female at every mile post.—*From Mr. Alexander Newlands' address "The Railway Highway" to the Permanent Way Institution.*

"SHEP."

THE BRIGHTON BELLE

ALL PULLMAN ELECTRIC

SUNDAYS 10am 5.0pm 7.0pm
WEDNESDAYS 11.0am 5.25pm 8.25pm
THURSDAYS 5.25pm 8.25pm

VICTORIA BRIGHTON

THE BRIGHTON BELLE—Scarlet, yellow, blue, and black on a white background are the tints employed in the composition of a vivid letterpress poster issued by the Southern Railway, which we reproduce above

OVERSEAS RAILWAY AFFAIRS

(From our own correspondent)

Wage problems in Argentina—Travelling without ticket in India—Rapid restoration of earthquake-damaged Indian lines—Italian goods traffic accelerations—Important reorganisation proposed in Switzerland

ARGENTINA

Railwaymen's Wages

The recent improvements in the traffic receipts of the Argentine railways, due chiefly to the fact that the grain exporters are taking advantage of the improved prices to ship everything they can without delay, irrespective of quotas, have induced the railwaymen's unions to insist on reconsideration of the arrangement come to with the companies in regard to cuts in salaries and wages. As a result of ineffectual attempts to achieve an agreement, the Director-General of Railways, Engineer Garcia Torre, proposed that the conferences should be suspended until the results of working for the financial year ended June 30 were known, but the unions have refused to countenance this delay. The annual conferences of both the Union Ferroviaria and La Fraternidad (the enginemen's society) are being held in Buenos Aires at the time of writing (June 15), and the leaders have already been subjected to much abuse from up-country delegates for their failure to obtain better terms from the companies.

Institute of Transport, River Plate Centre

At the inaugural session of the 1934 season of the River Plate Centre of the Institute of Transport, the Chairman, Mr. John Wilson, Traffic Manager of the Buenos Ayres Great Southern and Western Railways, read an interesting paper in which he summarised the development of the four principal British-owned railways in Argentina, namely, the Southern, Central Argentine, Pacific, and Western systems, during the last twenty years. Much statistical matter of interest was included, among which it was stated that the capital of the four railways mentioned had increased from £150,425,000 in 1913 to £217,800,000 in 1933.

A Workshop Visit

Some 40 members of the local branch of the Institute of Electrical Engineers, paid a visit on June 3 to the workshops of the B.A. Great Southern Railway at Remedios de Escalada, where they inspected the maintenance sheds, as well as the latest type of diesel electric locomotive, designed for use in connection with long haulage and heavy loads in the provinces, where good water sup-

plies are often very difficult to obtain. The party returned to Buenos Aires on a special diesel electric railcar, several members travelling in the cab and having a practical lesson in driving a diesel electric engine. At Constitution the party was entertained to refreshments by the representatives of the Southern Railway. Mr. Kenneth Eckhard, chairman of the local branch of the Institute, thanked the railway company for a most enjoyable and instructive outing.

BRAZIL

Paulista Railway Results

The annual general meeting of the Companhia Paulista de Estradas de Ferro was held in São Paulo at the beginning of June, and the working results for the year ended December 31, 1933, were announced in detail. Together with the balance of 12,586 contos carried forward from 1932, the total assets available for distribution amounted to 52,465 contos. Of this total, 26,383 contos were absorbed in dividends; sinking-fund and interest payments on foreign loans claimed 7,064 contos; while 4,365 contos were earmarked for afforestation work (this consisting mainly of the planting and cultivation of eucalyptus trees for supplying firewood both to the company and to private individuals); and a further 500 contos for the fund for improvements and traffic expansion. This left a balance of 14,153 contos, which is being carried forward to the current year's balance-sheet.

Incidentally, a sum of 24,559 contos which, by means of annual deductions from the company's receipts, had been accumulated for the purpose of forming a special fund for new works and rolling stock construction, was transferred to the fund for improvements and traffic expansion; this was rendered possible as a consequence of the Government's decree published in 1927, authorising thenceforward a surcharge of 10 per cent. on all rates, with the object of building up a general renewal fund, the total amount of which, at the end of 1933, stood at 59,306 contos, including interest paid by the State Bank of São Paulo.

By a decree passed in October, 1933, the company was authorised to extend its trunk line (which runs from Itirapina to Marília through Dous Corregos and

Agudos) as far as Pompeia—a distance of 30 km. Construction was begun in November, and the work is expected to be concluded by the end of the current year.

The rolling stock position at December 31 last was as follows:—

	1-60 metre	Gauge 1 metre	0-60 metre
Electric locomotives ..	45	—	—
Steam locomotives ..	78	86	11
Passenger vehicles (including inspection coaches)	175	146	15
Goods vehicles (including livestock wagons, cranes, and breakdown stock) ..	4,041	1,866	89

[We comment on the financial and traffic position of the Paulista Railway Company in an editorial note on page 96.—ED. R.G.]

FRANCE

Depression in Rolling Stock and Locomotive Industry

Rolling stock manufacturers in France are hard hit by the trade depression, the reorganisation of the railways and technical developments in transportation. According to a report just issued by the Chambre Syndicale of the manufacturers, orders for rolling stock have decreased seriously in recent years. The railways allotted contracts to the amount of 1,150 million francs in 1929; 1,380 millions in 1930; 319 millions in 1931; 321 millions in 1932; 207 millions in 1933, and only 150 millions are so far in view for 1934. Orders for steam locomotives totalled 281 in 1929; 404 in 1930; 103 in 1931; 60 in 1932, and 25 in 1933. For 1934, it is probable that only 10 locomotives will be ordered, out of 35 originally comprised in the programme approved by the Conseil Supérieur des Chemins de Fer.

The falling off in orders for wagons and vans is also considerable. The figures show that there were orders for 17,145 units in 1929; 12,525 in 1930; 2,354 in 1931; 3,326 in 1932; 2,345 in 1933. Up to the present, in 1934, only 30 refrigerator units have been ordered for the Paris-Orleans-Midi system, and the rest of the 2,800 wagons and vans comprised in the plans for the year will probably be constructed in the railway workshops. Orders for steel coaches show the following figures: 601 in 1929; 709 in 1930; 244 in 1931; 321 in 1932; 272 in 1933. So far in 1934 only 40 coaches have been ordered by the Est and 80 by the Etat systems out of a total of 325 approved by the Conseil Supérieur.

The report also examines the question of construction by railway workshops of part of the orders, which would otherwise go to manufacturing firms. Owing to reduced traffic, repairs and upkeep are not sufficient to keep the railway shops fully employed, and under the law the railways cannot discharge their workmen. Further, the railways were last year required to re-instate more than 5,000 men, who had

not been taken on again after the strikes of 1920. Most of these came from the workshops. To find occupation for the increased staff, the railways are naturally inclined to give their own shops new construction work, although the cost is greater than if given to private firms. This increases the railway deficits and causes private firms to discharge workers, thus adding to unemployment. Some firms are faced with the probable necessity of closing their shops.

On the other hand, orders for rolling stock by the Paris Metro. and the postal services still represent an appreciable figure. There is also an increase in deliveries of motor railcars and coaches, but the construction of such material is still in the trial period. The export of rolling stock continues to decline because of the high cost of construction in France.

INDIA

Monsoon Havoc

Heavy monsoon rains have resulted in serious dislocation of railway traffic on the Assam Bengal Railway and on some parts of the Eastern Bengal Railway.

Railway Labour

In order to give effect to the Geneva Labour Convention so far as labour in railway employment in India was concerned, the Railway Board obtained the sanction of the Finance Committee to make permanent the present temporary post of Supervisor of Railway Labour. The Committee also agreed to the employment of a special staff for the preparation of the Manual of Rules on establishment matters applicable to railway staff. The expenditure of Rs. 11 lakhs for subordinate staff quarters in Bihar and the earthquake area was approved.

Fare Reduction Problems

The section of the Indian public which is often clamouring for a reduction in third-class fares will be heartened to read the observations of the Pope Committee on this question. The committee is not satisfied that the present basis of passenger fares in the lower classes, which tapers in the vicinity of 300 miles, gives any inducement to increase the average load of passengers in these classes, the average journey being reckoned between 40 and 50 miles. Actually, for the year 1932-33, the average journey was 34.3 miles for third class and 46.9 miles for the intermediate class. In the opinion of the committee, the railway administrations might bring the tapering effect of their passenger fares very much nearer the average journey without any serious risk of reduced revenue, and such action would encourage long-distance travel. Indian railway authorities are generally in agreement with this view, and their policy has been to encourage

long-distance traffic. That they have not been able to go sufficiently far is probably due to the uncertain financial conditions of the past five or six years. Of recent months, fare reductions over shorter distances have been introduced on many railways with a view to regaining traffic lost to the roads.

Magistrate's View on Ticketless Travel

Mr. Jaini, Special Railway Magistrate at Lucknow, who daily tried 50 to 70 cases of travelling without tickets for six months last year, has expressed the view that, in the absence of an adequate deterrent, this practice will naturally increase. On a single train between Lucknow and Cawnpore, which he inspected with a railway officer, 25 persons were found without tickets. While the magistrate agrees with the Pope Committee that an amendment of the Railway Act is necessary to allow of sufficient penalties to act as a deterrent, he is of opinion that effective barricading of railway stations is likely to produce satisfactory results. This course would probably result in enough extra fares being received to make the capital expenditure involved a profitable investment. While ticketless travel is largely confined to third-class passengers, Mr. Jaini also mentions the more insidious class of well-dressed and seemingly respectable people who travel without tickets in higher classes.

Railway Engineers' Conference

The Engineering Section of the Indian Railway Conference Association began its annual meeting at Simla on June 27, with Mr. P. Hackforth, Chief Engineer, East Indian Railway, as Chairman. The agenda covered a wide range of technical subjects, such as speed on curves, water supply, control circuits, and waterways in relation to catchment areas and rainfall. Meetings of the Engineering Section have been suspended since 1930 for reasons of economy.

Prompt Earthquake Damage Repairs

The official report of the work of reconstruction following the disastrous earthquake in January last records the promptitude with which railway communications were restored, after over 900 miles of railway track had been damaged and nearly 250 bridges or culverts destroyed or damaged. Out of 2,100 miles of track on the Bengal and North Western Railway, the system most greatly affected, 1,683 miles had been reopened to traffic by the end of January, a further 300 miles were opened in February, and by the middle of April all lines were carrying traffic.

[Some idea of the effects of the earthquake were given in the illustrations reproduced on page 468 of our issue of March 16, and pages 1140-1 of June 29, the latter showing particularly scenes on the Bengal and North Western Railway.—Ed. R.G.]

ITALY

Cloudburst on Genoa-Ventimiglia Line

A violent cloudburst over Savona and the Littoral and the subsequent flooding of the railway track where the water reached a height of 11 ft. caused the interruption of railway traffic for half a day on the stretch between Savona and Albissola on the Genoa-Ventimiglia Line. No serious damage was done.

Railway and Industrial Profits

The Società Italiana per le Strade Ferrate Meridionali realised last year a profit of 22,243,386 lire (£370,723), and a dividend of 5 per cent. has been declared. This is one of the big railway companies which were taken over in 1905 by the State. Though it retains its old name, it has now become a holding company, with interests in private railways, shipping, finance and some of the biggest industrial undertakings, but it does not operate any lines.

Also, the Terni steel works has published its balance sheet with a net profit of 25,892,684 lire (£431,513) and is paying a dividend of 4 per cent. on the ordinary and of 8 per cent. on the preference shares. The Terni is the biggest steel works in Italy and specialises in railway material of all kinds. At the same time it owns some of the biggest hydro-electric power plants in the country, and is supplying power in great volume to the State Railways.

The Chinese Vice-Minister of Communications, Uè-Fi-Bon, has arrived at Rome at the head of a mission to study the organisation of the Italian State Railways. The Minister proposes during his stay in Italy to visit the railway workshops, the main lines and principal stations and some of the hydro-electric power plants of the State Railways.

Goods Traffic Accelerations

The new Minister of Communications, On. Puppini, is continually inspecting the most important works under construction on the State Railways. Amongst his most recent inspections should be mentioned that of the new station at Florence, where work is advancing in accordance with programme, and judging by the present activity it would not be surprising if the new station should be ready earlier than originally fixed.

The State railways now own 24,000 special trucks for the conveyance of perishable goods. Special arrangements with foreign railway companies make it possible to run perishable goods trains through the whole of Europe on a strict time table. The speed of these trains has been considerably increased so that Sicily is brought within 51 hours from the Northern frontier stations. The time taken by these goods trains from Campania and Puglia has been reduced to 30-35 hr., from Tuscany to 18 hr., and so forth. At the same time these

trains travel now from the Italian frontier to Munich, Zurich and Basle in 7-12 hr., to Cologne in 20 hr., to Frankfurt, Vienna, and Budapest in 22, 24 and 35 hr. respectively, to Berlin in 38 hr., to Hamburg and London in 45 hr. and to Copenhagen, Oslo, Stockholm in 95-120 hr. The importance of the continuous improvement in overland transport has been referred to at the annual assembly of the Instituto Nazionale per l'Esportazione (National Export Board) by the President, On. Lantini. The Ministers of Finance, Communications and Agriculture, On. Jung, Puppini and Acerbo, as well as the Governor of the Bank of Italy were present at this meeting, in itself a clear indication of the tantamount importance of the Instituto in the economic life of the country and, in particular, the presence of the Minister of Communications emphasised the fact that the State Railways are fully aware overland export and its further development depend to a great extent on the organisation of the railways, the regularity of their goods service and the cheapness of the tariff rates.

SPAIN

Regrouping of Railways in Viscaya

The various narrow gauge railways in the Viscaya provinces, as published in THE RAILWAY GAZETTE of June 1, are more or less in agreement in respect to the proposed regrouping of all the lines in that district, and have not solicited the approval and support of the Government in order to bring the negotiations to a satisfactory termination. In view of this, a Decree has just been issued appointing a commission to investigate and report, within three months, on the different questions raised by the companies. One of the points of the terms of reference of the commission is the study of some form of co-ordination of road and rail transport in the district served by the company which is to be formed.

New Rolling Stock

IN THE RAILWAY GAZETTE of June 22 the result of an interview of the representatives of two of the principal firms manufacturing railway material, with the Minister of Public Works, was reported. The promises then made by the Minister have been fulfilled in the form of a Decree published in the Madrid Gazette of June 20 authorising the acquisition by the principal railway companies of 150 new locomotives; 40 for the Northern of Spain, 60 for the M.Z.A., 25 for the Andaluces and 25 for the National Western. The new locomotives are to be paid for by the State, the amounts expended being treated as contributions of State capital to the respective companies, in the same form as previous advances for extensions and betterments. The maximum value of the locomotives must not exceed 60 millions of pesetas, to be paid in a minimum period of six years.

SWITZERLAND

Important Reorganisation Scheme

A carefully prepared scheme for the reorganisation and the financial reconstruction of the Federal Railways has been prepared by the Federal Councillor in charge of the Department of Posts and Railways, in collaboration with the Head of the Railway Administration and two other high railway officials.

The project, comprised in the text of a short emergency Decree and of a longer Bill, has been submitted for consideration to the Board of Administration of the Federal Railways, which will examine it during the summer months in order that the draft Decree and Bill can be placed before Parliament during the autumn sessions. It is thought that it may take some years for the Bill to be passed by the Federal Council and by the two Chambers, in addition to being submitted to a referendum. Moreover, it is anticipated that it will meet with severe criticism, and that the ensuing delay cannot but prove unfavourable to both the railways and to State finance. It is therefore imperative, in the opinion of the principal sponsors of the scheme, that the railways administration should be placed in a position to effect economies and to simplify its administration immediately.

Emergency Steps

It is considered desirable that the initial steps towards the final reorganisation of the Federal Railways be taken as preparatory measures during the passage of the Bill, and the emergency Decree proposes to authorise the Federal Council to order any simplification it may deem desirable in the organisation of the Administration, to allow the railways to transport persons and merchandise by road as well as by rail, and to fill vacancies in the service by un-established officials.

Plans for Autonomous Working

The Bill provides that the railways shall become a juridical person (or separate legal entity) with the greatest possible autonomy and that it shall be able to manage its own affairs without political interference. No new debts are to be incurred without the previous consent of the Swiss people and provision is made by which the system is no longer to be run at a loss. The State will take over the entire indebtedness in excess of 2,000 million francs (which is computed at about 1,000 million francs) and its amortisation within 60 years. The State has also to supply 50 million francs for working capital and approximately 15 million francs towards the railway pension fund.

Although the project seems to have met with the approval of the majority of the public, the Swiss General Trades Union has passed a resolution denouncing the proposed measures and stating its firm intention of opposing them

strongly. Moreover, in spite of its favourable comments, the press stresses the point that, if the Swiss people rebuy their railways a second time, they will want serious guarantees that they will not be expected to do it a third time.

THE FAR EAST

"Buy Chinese!"

The British piecegoods trade has suffered a considerable reverse in China, and a further reverse is foreshadowed by a declaration by officials of the Chinese Ministry of Railways that they will in future refrain from buying any more foreign goods and will wear only native material. The uniforms of Chinese railway officials have hitherto absorbed a considerable amount of the imported material of the British manufacturer.

New Crossing Loops for Nanking-Shanghai Railway

The Nanking-Shanghai Railway has long been in need of additional crossing loops. Most of the crossings take place at the stations, but there are long sections at different parts of the line where there are no means of crossing trains and serious delays have resulted in consequence. To meet this difficulty the Ministry of Railways has arranged for twelve additional crossing loops to be provided. This will materially assist traffic operations and increase the turn-round of locomotives and rolling stock. The railway is a single-track system operated by electric train staff.

Proposed New Railway in South China

Survey work on the projected Samshui-Hohsien Railway, linking up Kwangtung with southern Kwangsi, has been completed. The line, which will be 526 kilometres in length, is to run from Samshui, north-west of Canton, traversing the districts of Szewhui, Kwangning and Huaitse, in Kwangtung, to Hohsien, southern Kwangsi. The total cost of construction is estimated at \$20,000,000. Detailed plans have been drawn up jointly by the Kwangtung and Kwangsi Provincial Governments, and will shortly be submitted to the Ministry of Railways for approval.

Huainan Railway Construction

Construction work on the road-bed of the Hwashan-Hofei section of the Huainan Railway (south of the Huai River) has been completed under the direction of the National Reconstruction Commission. The Construction of bridges and tunnels and platelaying will follow at once, and the first consignment of 6,500 wooden sleepers has already been shipped to Hwashan. A second shipment of 165,000 sleepers is, according to the Chinese Economic Bulletin, on the way from the United States. Large quantities of rails are also being shipped to China.

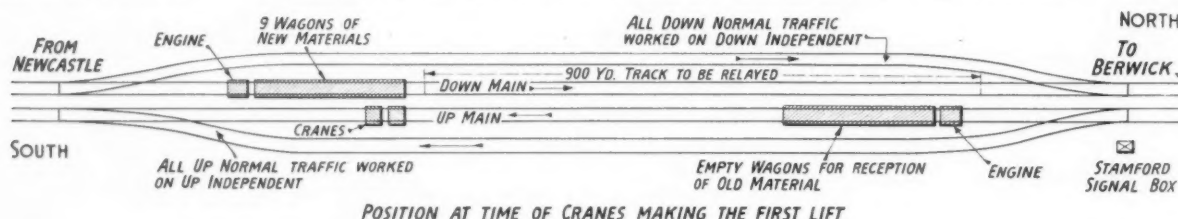
RELAYING WITH STEAM CRANES

A method recently adopted in the N.E. Area of the L.N.E.R. for expediting and economising relaying under certain conditions

THOUGH there is nothing new in dealing with lengths of railway track, or indeed of making considerable lifts of assembled point and crossing work, by steam crane, it may well be that the possibilities of relaying stretches of plain track by such means have not yet been fully investigated. We have received some details of such an operation recently carried out in the North Eastern Area of the London & North Eastern Railway.

The work allotted to the day comprised the removal and replacement of 900 yd. of plain track in the down line of the main East Coast Route at Little Mill, 40 miles north of Newcastle. On this site circumstances were

intended load. Levelling the ballast for the reception of the new track followed up behind, and an initial stretch was ready as soon as the train of new material arrived. The latter train was pushed northwards by its engine on the down line with the foremost of the nine loaded wagons immediately adjacent to the newly formed gap in the track; the engine was then detached and run over the nearest crossover on to the up main line in order to draw back the cranes from the rear of the empty train until they were abreast of the loaded wagons to be unloaded. It then returned to the rear of its load to be ready to draw back the wagons as emptied, dispose of them in the goods



particularly appropriate for such procedure, inasmuch as there is an independent running track adjacent to both the up and down lines with a 10-ft. space between, so that for the requisite period of time all traffic could be diverted with no more delay than the retardation of trains necessary for their passage over the turnouts at each end.

Two trains were required for the execution of the work, first a train of empties into which to load the old material consisting of old N.E.R. standard track with rails 45 ft. in length, and secondly a train consisting of quintuple wagons containing new material assembled in 60 ft. lengths with the requisite runners between and accompanied by two steam cranes. The new track was previously assembled in the company's storeyard at Newcastle and lifted by crane to give a load five tiers high in each of the nine wagons employed. The train of empties, which included the two cranes, was timed to travel well in advance of the train of new material and on its arrival occupation was taken of both main lines, whilst traffic passed on each side. The empty train was placed on the up main line and was slowly moved as the work of demolishing the old down track proceeded, from south to north, to allow of wagons being opposite their

yard nearby, and feed the succeeding wagons to the cranes by propelling them on to the new track as it was deposited.

The lifting of the 60 ft. lengths of track was facilitated by the provision of a lifting girder for each of the two cranes; the girders were provided with three cross arms to allow of six vertical attachments so that all liability to undue strain of fastenings and distortion of the sections of track was avoided. Although weather conditions were adverse and untoward events occurred, the 900 yards of track were laid down within the short period of four and a half hours.

It is clear that the procedure which we have described has definite limitations. Two tracks must always be available for such an operation and cases where tracks at the side are or can be made available for working normal traffic must perforce be few.

We understand, however, that further experiments are in mind with a view to increasing the speed of such operations so that a preconceived programme on such lines may well come to be developed in order to cope with a considerable percentage of the relaying programme of any year.

New Diesel-Engine Locomotive Cranes

A new type of diesel-driven locomotive crane is now being built by Thomas Smith & Sons (Rodley) Ltd., in two standard sizes 5-ton and 2-ton. Of these the former is the more interesting and the following are a few details of it. The engine is a 75 b.h.p., six-cylinder, Blackstone, designed for full output at 1,200 r.p.m., though the speed range is 230-1,350 r.p.m., this being conveniently controlled by the driver without moving from his seat.

The engine, which is a spring injection unit, drives the clutch shaft through a fluid coupling and machine cut double helical gears. Slewing, travelling and derricking are effected by two sets of fibre-lined double-plate clutches. The barrel is either in two halves for operating a double

grab-line or is for single rope working, a 5-ton load being hoisted at about 120 ft. p.m. and a 3-ton at 180 ft. p.m. The capacity is 5 tons at a radius of 16 ft. and 1½ tons at 30 ft. For grabbing it can lift 3½ tons gross at 16 ft.

A feature of the transmission is a relay clutching device which necessitates only a very small effort to manipulate the clutch with the hand control. The crane can hoist and slew at the same time, or travel and slew in either direction. Free use has been made of electric arc welding. For instance, in the 40 ft. centre jib, which is of four-sided lattice design, made of rolled steel sections, a saving of nearly 25 per cent. in weight has been secured by substituting welding for normal non-welded practice. Welding is

also extensively used in the under-carriage. The centre casting carrying the crane-post is made in one piece with the brackets for the travelling gear. The whole mechanism is handily controlled and housed in a roomy cab with ample windows, and an automatic indicator shows the radius at which the crane is working and the load corre-

sponding to the radius. The total weight of this crane is about 24 tons.

The two-ton model has a 24 b.h.p. (at 1,200 r.p.m.) engine and lifts two tons at 16 ft. radius or 10 cwt. at 24 ft. radius, and is fitted alternatively with flanged, rubber-tired or caterpillar wheels.

A GERMAN TRACK RECORDER

A new apparatus for registering the relative movement of two adjacent vehicles is being used in Germany for recording the condition of the track

By EDWIN P. A. HEINZE

A TRACK recording instrument has been evolved by the Knorr Bremse Company of Berlin, and having, we understand, undergone extensive trials successfully, is now in regular use on a number of districts of the German State Railway system. It consists essentially of two parts, the transmitting system and the graphical recorder, the latter being fitted to a stand secured to the floor of a locomotive cab. The transmitting system is clearly shown in our illustrations and consists of a normally horizontal rod, one end of which is suspended by a universal joint from the cab roof and the other is held, also with a universal joint, by an adjustable upright fixed either on the tender or in the case of a tank engine on the next vehicle. The horizontal rod therefore registers the relative movement between the engine and tender or next vehicle.

In order to transmit this movement to the recorder, the rod passes through two slots which are free to move in corresponding slides fixed in the square frame shown in Fig. 2. One of these slides permits of vertical and the other of horizontal movement only and a bowden wire connects each with the recorder. The latter consists of the usual paper strip passing from one drum to another at a speed proportional to that of the locomotive, the second drum being driven by means of a flexible shaft from one of the axles. Two pencils are connected with each bowden wire, are free to move on two rails running across the paper and so record the vertical and horizontal movements of the transmitting bar by means of transverse deviations from the straight lines they would draw were there no relative movement whatsoever between the vehicles. A third pencil is controlled by a knob on the

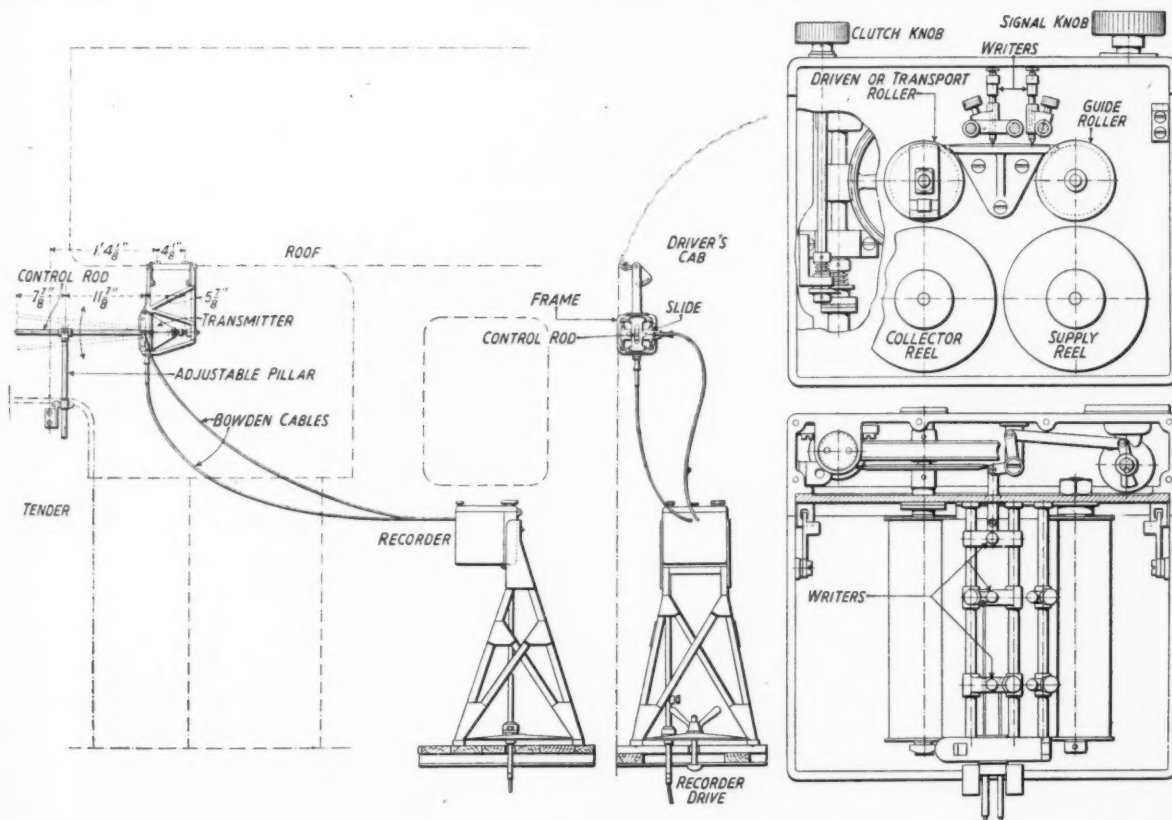


Fig. 1—Arrangement of transmitting and sending apparatus as fitted for showing relative movement due to track irregularities of a locomotive and tender

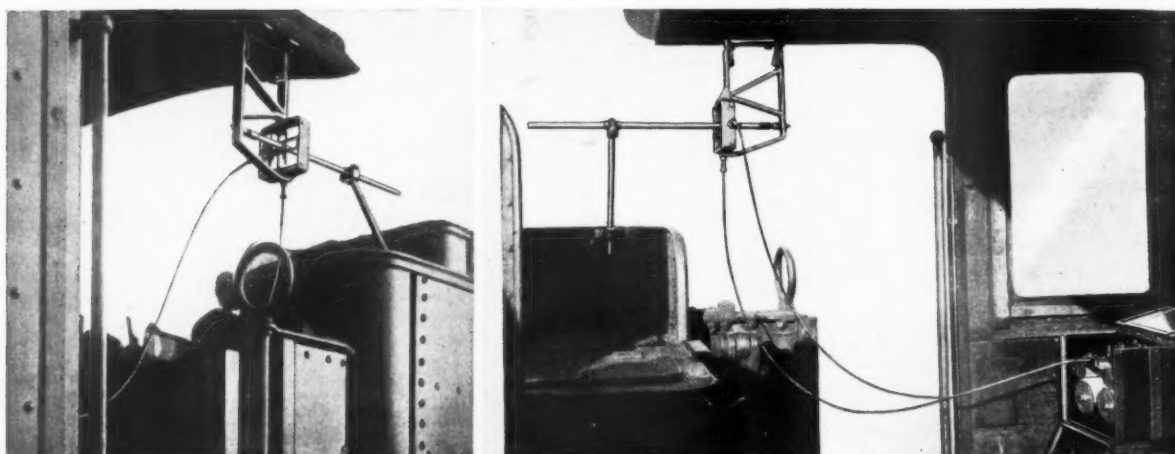


Fig. 2—Two views of the horizontal rod supported between the locomotive cab and tender, and its connection with the recording apparatus

recorder by means of which the observer can register on the paper strip the positions of fixed points, a tap on the knob making a transverse dash to the otherwise straight line drawn by the pencil. In Germany a single tap and dash usually denotes a 100-metre post, a double one a kilometre post, three dashes the centre of a station, and so on. By continued pressure upon the knob lengths of tunnels or bridges are recorded. It is similarly possible to indicate the lengths of curves.

Records with Tank Engines

In cases where the transmitter rod has to be fixed on a vehicle following a tank engine, rather long bowden wires have to be used, and it has been found advisable to fit powerful return springs to the pencils to overcome friction as this tends to render inaccurate the records. Also the relative movement between a vehicle and a tank engine is generally greater than between a tender and engine, and for this reason a longer control rod has to be fitted giving a reduction ratio between the full move-

ment and that on the slides at the transmitter of 8 to 1, while normally between tender and locomotive a ratio of 4.5 to 1 has been found most suitable.

In consideration of the rather large movements of tank engine axles the Knorr Bremse Company has designed another form of drive to replace the flexible shaft drive as used on tender engines. The drive consists of bevel gears in a casing fitted on the locomotive axle and connected through a telescopic shaft with universal joint to the mechanism in the recording box.

As the writing systems are of the lead pencil type, thin and rough faced recording paper is used. This type of writer is considered more practicable for the purpose than the more generally used inkers, which require frequent attention to work faultlessly. A stationary set of two further writers is provided on a third transverse rail in front of the recording writers. This set can be used to draw zero lines if wanted. Finally, there is a second knob for the purpose of disconnecting the drive of the recorder.

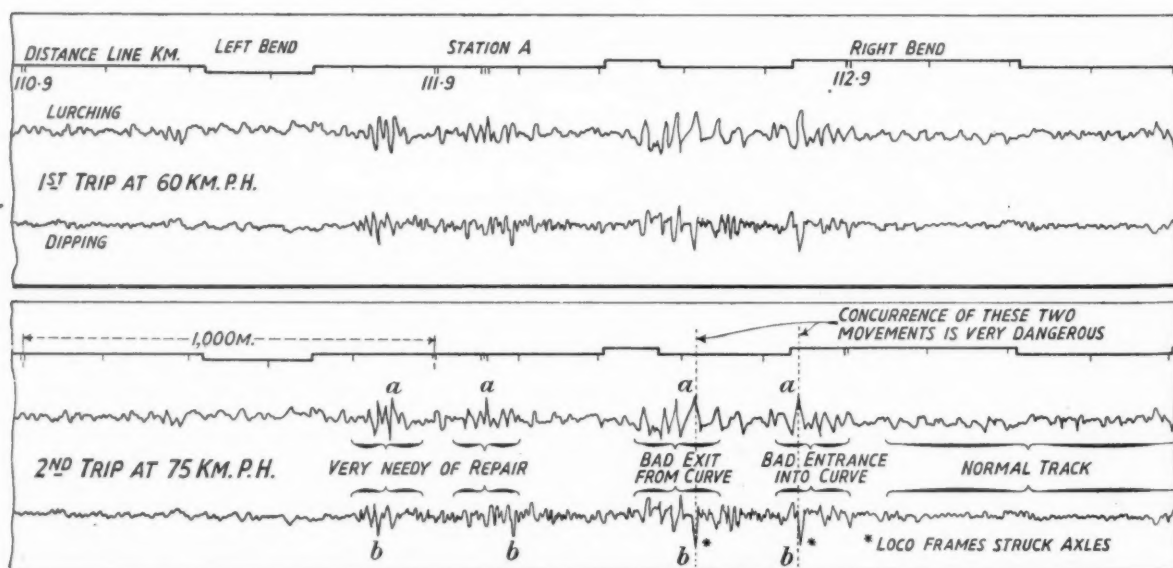
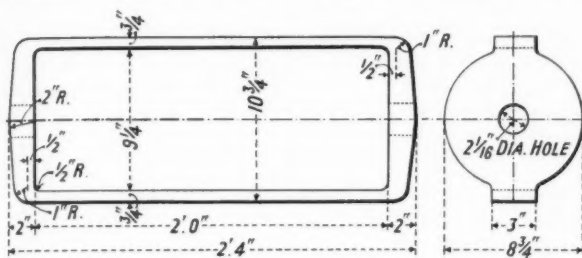


Fig. 3—Specimen of track record produced by the Knorr apparatus

AN IMPROVED DRAWBAR CRADLE FOR RAILWAY WAGONS

*An all-steel fabricated type introduced by the
Gloucester Railway Carriage & Wagon Co. Ltd.*

THE Railway Clearing House standard design for draw-bar cradles has altered only in respect of its dimensions since it was first incorporated in the 1887 specification. The dimensions have been increased quite considerably, particularly at the ends, and the latest form of standard cradle as shown in Fig. 1 represents quite an



important forging. As now specified it must withstand a minimum pull of 60 tons without fracture, and the approved material is either grade A iron, or mild steel of welding quality.

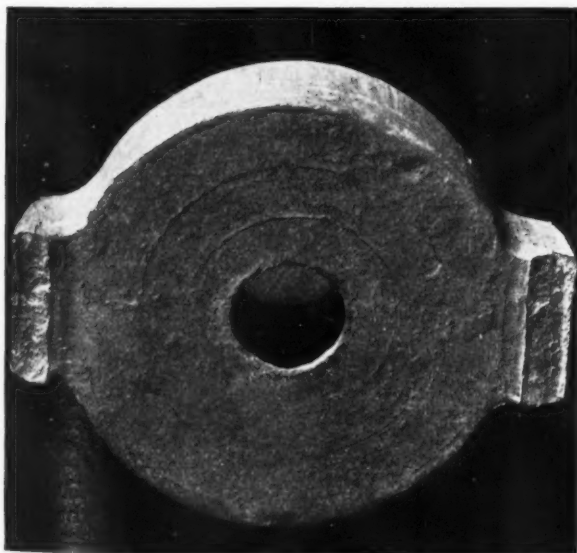
The cradles are usually made as two forgings welded together at the sides. With the increased dimensions now in use, it means that the material at the right angle corner where the sides leave the ends, must be fully heated to make the bend, almost as hot as the actual weld, and failure at this point frequently takes place, so that there are six possible points of failure existent in each cradle, *i.e.*, the four corners, and the two side welds. The type of failure at the corners is shown by Fig. 2, representing an actual breakage in service.

At the moment, the standard welded design is the most

largely used, in spite of frequent breakages; it may be shown that some 10 or 12 per cent. of the drawgear failures are due to the cradles, but of the failures reported it must be remembered that this does not include breakages off the main line, such as colliery companies' branch lines and sidings, and when it was stated in evidence that one of the largest wagon repairing companies replaced as many as 4,000 drawbars in a year,* the proportion of cradles must be quite a large figure for replacements alone while those required for new construction must be very considerable.

From the safety first point of view there is thus a field for something of an improved character, provided it can be made competitive in all respects, including cost, though even if this were slightly higher, the advantages of a trouble-free detail would be well worth some small additional outlay.

The latest cradle to be placed on the market is the all-steel fabricated drawbar cradle (Willans patent), the sole manufacturer of which is the Gloucester Railway Car-



riage & Wagon Co. Ltd., shown in Fig. 3. The design presents some interesting features. Practically speaking no smithing or drop stamp forging is required. The ends are cut from slabs, on a coal-acetylene gas cutter machine; this leaves them cut clean to shape, requiring only the raw edges to be dressed off, and the drawbar holes to be drilled. The sides are bent to shape, the whole being clamped together in appropriate jigs, and electrically welded as shown.

Compared with the approved 60-ton minimum breaking load, repeated tests have proved that this can be easily and constantly exceeded, both by works tests, and special outside independent tests made at the Sheffield Testing Works. These tests are available to anyone interested, but it may be stated here that, using the same sections as the standard cradle, the breaking load obtained is over 118 tons, *i.e.*, nearly twice as much as the approved figure.

The cradle is fully approved by the Railway Clearing House. The makers have an unique experience in electric welding as applied to rolling stock, whilst the patentee has also similar experience from the inspection side, so that in putting this cradle forward the makers have every confidence that wagon owners will endorse the results from actual experience.

* See Official Report, Accident at Dagenham, December 18, 1931.

AN ARCHITECTURAL RENAISSANCE ON THE L.N.E.R.

On the main line widening between York and Northallerton the new buildings have been designed for attractiveness and efficiency

IN previous issues we have described the engineering details and the signalling of the main line widening between York and Northallerton, but we referred only briefly to the station buildings. A recent inspection confirms the good impression they created at our first visit. In all the details of this widening the Engineer for the North Eastern Area—Mr. John Miller—has obviously aimed at a high standard of design, neatness, and order. On the architectural side of the work Mr. Miller has been exceptionally well served by his architectural staff, and the buildings deserve something more than our previous passing reference.

Beningbrough, Alne, Thirsk, and Otterington are the principal stations at which the widening has given an opportunity for the erection of new station buildings, and in their design it is evident that the guiding principle has been to depart from the dull and uninspired style which apparently was considered sufficiently good for the passengers of previous generations, and to adopt instead a style instinct with the tenets of good modern design. In all the new buildings there is a family likeness which proclaims an artistic parentage. The brickwork is in multi-coloured reds, with wide flush lime mortar jointing; consistent use is made of brick-on-end features for the window heads and the tops of the walling, and in nearly all cases the dressings are re-constructed stone, commendably free from crazing. The roofs are covered with red tiles, sprocketed at the eaves with a generous overhang. Metal casements fill the window openings, with tiles or stone bands for sills. A variation from the usual hollow wall construction has been tried by building two half-brick walls with a 1 in. space filled with asphalte, thus binding the two walls together; this method should prove excellent for preventing the penetration of damp since it eliminates the liability of patches of moisture appearing where the mortar has not been cleaned off the ties used in hollow walling.

A pleasing feature of the layout of these stations is that wherever possible the signal-box has been given a definite place on the platform as a member of the group of station buildings, built in the same style and of the same materials, instead of being condemned to pass its days beyond the platform ramp, in a state of weather-boarded despondency. At Beningbrough—that the signalman may have a clear view over the adjoining bridge—the box has been built in two well proportioned storeys, with a stone plinth and a stone upper band that lines with that of the bridge. In the main buildings a wide stone frieze band ties in the elevations, and is broken by a central panelled feature embodying two doorways and two windows. On the other platform a pleasant little brick and glass shelter proclaims its family relationship.

At Alne the signal-box stands upon the platform in front, but at the back it is carried down to the natural ground level to provide a staff apartment in the lower portion. The entrance to the booking office is emphasised by a stone surround which perhaps looks a little top-heavy, but the eye is consoled by dwelling upon the satisfying appearance of the adjoining brick-on-end and stone capping to the top of the wall, wherein the whole effect is gained by slightly battering the face of the stone, instead of letting it rise up vertically, and interested

observers should mark what a great difference that little detail makes. Another little thoughtful detail at Alne—this time in the planning—is the formation of a recess in the back wall of the platform, to accommodate a cantilevered seat; at the ends of the recess are specially designed concrete tubs filled with flowers, but we feel that this recess would be better set off and given more point if each tub were planted with a tall shrub trimmed to a conical shape.

At Beningbrough and at Alne a new house for the stationmaster has been built, each to the same design, with tiled roof and rendered walls set upon an exposed brick plinth. The stone surround to the front door has been well managed and gives to the front a note of quiet dignity too often lacking in similar efforts done by speculating builders. The house is L-shaped on plan and on the ground floor contains two reception rooms, a kitchen, and the usual offices. An effect of good quality is given to the whole house by the generous size of the window joinery.

We have previously illustrated the signal-box at Sessay Wood, a particularly pleasing example. So, too, have we illustrated the signal-box at Thirsk, but they deserve to be repeated for they are buildings of decided individuality. It houses a staff room on one side and a signal relay room on the other, the signal-cabin itself being on top, in the centre. Under the cabin the supporting wall is brought slightly forward, forming a break which provides a stop for the brick-on-end and stone capping that runs along the top of the wings. By its large expanse of brickwork, broken by only one window, this forward portion makes a satisfying foundation to the cabin, and although it disrupts the continuity of the stone-capped wings it has the effect of binding them together and no doubt this is due to the repetition under the cabin windows of the brick-on-end banding seen on the wings. The bays at each end of the cabin give a pleasing form to the superstructure, and it would not be suspected that staircase access is the reason for one of them. The formation of the plinth in brick and not in stone is doubtless artistically right; were it in stone it might by its continuity call attention to the break in the run of the stone capping to the wings. A very interesting structure, with which our illustration of some old huts opposite this signal-box may be contrasted.

At Otterington station full play has been given to rhythm, proportion, and order. The approach on the road side is tidily laid out, with the main building set up on a grass lined terrace and reached by a flight of steps, the central entrance being strongly emphasised by a stone feature which breaks up above the eaves. On each side long and short windows, stone plinths, sills, piers, and frieze exactly repeat themselves; indeed, so perfect is this rhythmic repetition that it creates a wish for a concrete lamp-post to be placed on the left of the steps to balance the existing one on the right, and for another on the right of the terrace to match that on the left. Perhaps in course of time these will be provided and the old-fashioned tops to these modern posts be replaced by something more in keeping with new modes.

The photograph of Otterington station clearly shows a very commendable feature of all the track and its



Otterington station buildings from the station yard



Alne station approach, booking hall and signal-box



Beningbrough station platform buildings

ATTRACTIVENESS AND EFFICIENCY IN MODERN L.N.E.R. STATION BUILDINGS



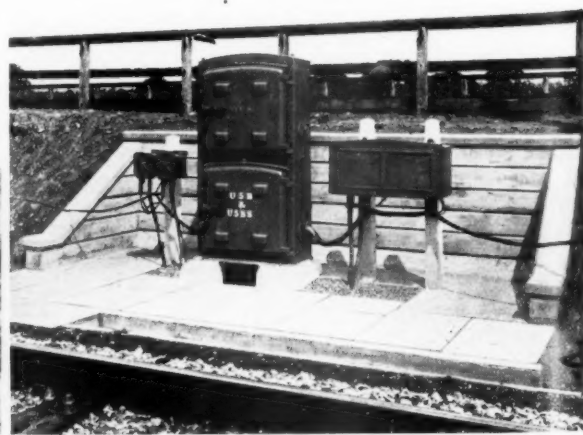
"Semi-lunar" plot at King Edward Bridge junction, Gateshead



Monkseaton station, showing neat grass plots on site of abandoned middle track



Concrete side channel, York-Northallerton line



Relay cabinets with concrete retaining wall surround

MAKING THE BEST OF THE PERMANENT WAY, L.N.E.R.

*Thirsk signal-box*

adjuncts, not only on the widening itself, but also further to the north of York, namely the use of pre-cast concrete curbing and stops of uniform design. Along the track, wherever opportunity offers, little enclosures have been formed with this curbing and therein grass or plants are grown, or ballast tidily arranged. We give two illustrations, one being of an enclosure near Newcastle known locally as the "semi-lunar," on account of its shape. Not only do these enclosures give an aspect of tidiness and neatness to the track but, being the subject of percentage marks, inculcate a spirit of friendly rivalry amongst the permanent way men and those responsible at the various stations. This desire for neatness and cleanliness is displayed throughout Mr. Miller's domain; evidently he believes that where there is gloom there is likely to be dust and disorder, and so all the new station apartments have been provided with good natural lighting. Particularly is this so in the booking offices, where the old-fashioned narrow hatch—set in an expanse of bill-posted wall—has been replaced by a screen glazed full-length, which gives a feeling of airy openness in marked contrast to the booking offices of old.

Internally the buildings have been finished plainly, but in good style; extensive use has been made of fibre board-

ing for the ceilings, and this should eliminate those unsightly cracks that seem inevitable in the usual plaster ceiling.

In the Tyneside electrified area, and at certain stations elsewhere, Mr. Miller is tentatively adopting an

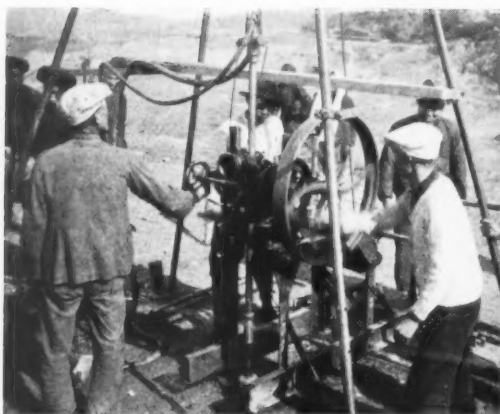
*Old huts opposite Thirsk signal-box—a contrast*

emerald green as the general tint for the external painting, picking out certain features in varying colours for different stations.

On page 98 of our editorial columns we comment in general terms upon these new works of the York-Northallerton widening.

*Stationmaster's house at Alne**New signal-box at Sessay Wood*

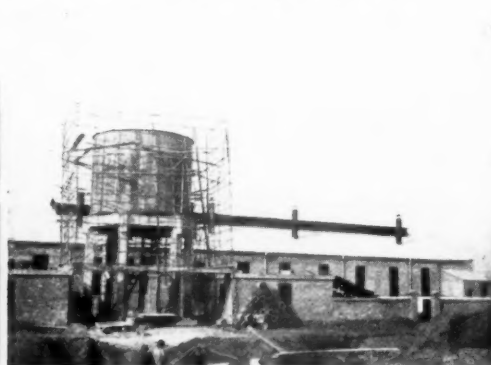
Canton-Hankow Railway Construction (See page 119)



Boring on the Chaoling bridge site



750-ft. tunnel under construction through hard rock



Boxer Indemnity Fund materials. Left: 43 kg. rails being landed at Whangsha wharf. Right: Lochang station water tank, built of B.I.F. materials

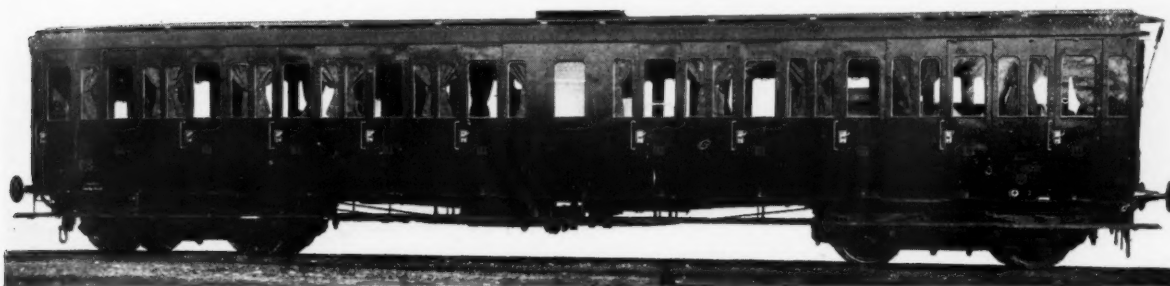


Pre-cast concrete blocks for tunnel lining



Recently completed 1,400-ft. tunnel

Italian Wooden-Bodied Coaches Converted to All-Metal Construction



For some years past the Italian State Railways have built only all-metal passenger coaches. There are over 3,000 now in service, and all fast trains are composed of them exclusively. There remains, however, a certain number of third-class coaches with wooden bodies. These are used only on local lines. Whenever they are sent to the shops for thorough repairs, they are partially dismantled and an all-metal body is substituted for the old wooden body.

In 1905, when the State took over the several Italian main lines, a type of passenger coach was evolved which had a metal underframe with a wooden body lined outside with iron panels. This type of construction remained standard up to 1920 subject to certain alterations in length and internal arrangement.

The replacement of the old wooden bodies by new bodies of steel is a comparatively simple and inexpensive matter, as the old underframe remains practically unaltered. One of the accompanying illustrations shows the steel body in course of erection.

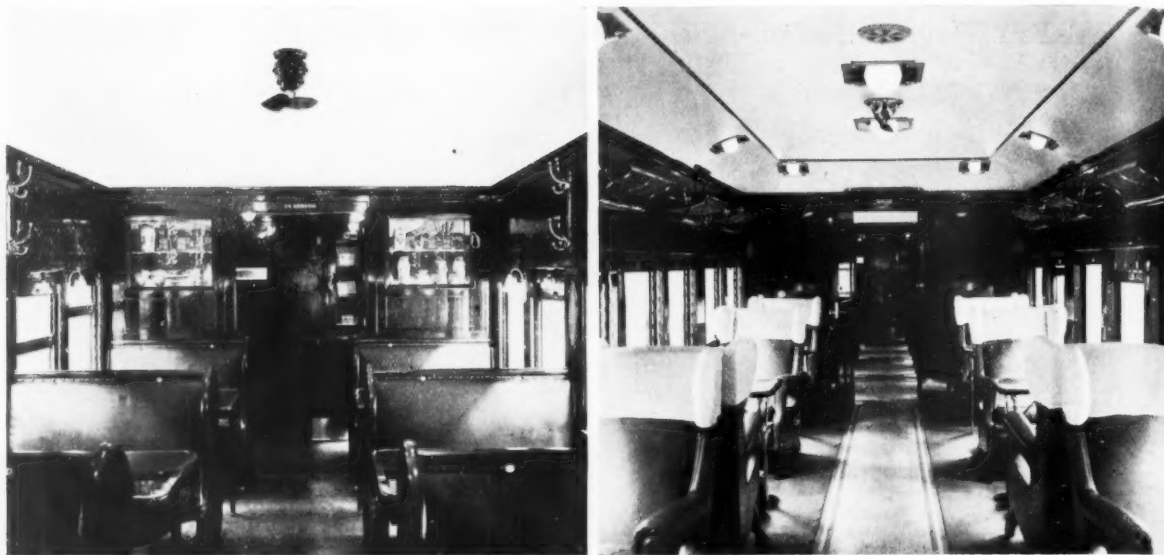
The first experiments with the transformation of such coaches was made in 1928 and the excellent results obtained warranted the continuation of this practice. There are now 850 such reconstructed coaches in service.



Photo]

[A. Neville Eastlie

Impressive view of the down Birmingham and Birkenhead express, G.W.R., passing Beaconsfield, headed by 4-6-0 locomotive No. 6015 "King Richard III"



New combined Pullman and dining car on the Central Argentine Railway; the left view shows the dining section. Brief particulars of the vehicle, which was built in the company's workshops at Rosario de Santa F , are given in a news paragraph on page 123



Scene at the official opening in the Prussian Landtag, Berlin, of the 24th Congress of the International Union of Tramways, Light Railways, and Public Motor Transport Undertakings on July 2, under the patronage of President Hindenburg and the presidency of M. F. de Lancker (see editorial note on page 96)

RAILWAY NEWS SECTION

PERSONAL

Mr. F. E. Rebbeck, Chairman and Managing Director of Harland & Wolff Limited, has been appointed a Director of the Northern Counties Committee of the London Midland & Scottish Railway, in succession to the late Mr. Frank Tatlow.

Mr. H. S. Cole, Dock Superintendent, Eastern Docks, Hull, L.N.E.R., has been appointed Chief of Police, North Eastern and Scottish Areas, in succession to Lt. Col. G. A. C. Webb, who will retire under the age limit in October next.

Sir Alexander Gibb, G.B.E., C.B., M.Inst.C.E., has been appointed an additional member of the Royal Fine Art Commission.

Dr. Ramon Videla has been appointed a member of the Local Board of the Buenos Ayres & Pacific Railway. Dr. Videla was born in Mendoza and for some time held the position of Legal Adviser to the Argentine Great Western Railway. When the B.A. & Pacific Railway took over the management of the Transandine Railway, Dr. Videla was transferred to Buenos Aires and for several years has been one of the chief legal advisers to the company of which he has now been appointed a local director. Dr. Videla has also been appointed by the Argentine Government to replace the late Dr. Angel Gallardo as a member of the special committee which is enquiring into the financial condition of the foreign-owned Argentine railways. Dr. Gallardo, whose death we recorded in our issue of May 25 last, was also Chairman of the local board of the Buenos Ayres & Pacific Railway, but no announcement has been made as to his successor in this capacity.

Dr. Roberto M. Ortiz, Minister of Public Works during the presidency of Dr. Marcelo T. de Alvear, has been appointed by the Argentine Government as an additional member of the official committee of enquiry into the conditions governing the foreign-owned railways in Argentina.

Mr. Frank T. Oliver, Secretary of the Local Board of the Buenos Ayres Western Railway, left Buenos Aires for London on leave on June 14.

Mr. A. V. Venables, M.C., V.D., M.Inst.C.E., M.Inst.T., M.I.E. (India), who, as announced in THE RAILWAY GAZETTE of April 27, has been appointed to succeed Sir Hugh Hannay as Agent of the East Indian Railway, was born in 1880 and educated at Bedford School and the City and Guilds of London Technical College, Finsbury. From 1898 to 1900 he was a pupil at Yarrow & Co. Ltd., Poplar, and serving with the Royal Engineers in the South African war, 1901-02, was awarded the

three times in despatches before being released from military duty in May, 1919. On return to the E.I.R., Mr. Venables was posted as Additional Secretary to the Agent and was promoted to be District Engineer in 1922. Upon the inauguration of the divisional organisation in 1925, he was selected as a Divisional Superintendent. It was in 1929 that he was promoted to be Chief Engineer, the post he has held until his recent appointment as Officiating Agent. Mr. Venables is a Member of the Institution of Civil Engineers, of the Institute of Transport and of the Institution of Engineers, India, and holds the Volunteer Decoration.

Mr. James Calder Angel, a Local Director of the Buenos Ayres Western Railway, has been appointed Chairman of the Buenos Ayres Midland Railway, in succession to the late Mr. F. J. Wythes, whose death, at the age of 77, we recorded in our issue of June 22 last.

Mr. F. K. Sah, Director of the Engineering Department of the Ministry of Railways, Nanking, China, is at present on a short visit to this country to study various technical problems in connection with railway development in China. In order that he should have an opportunity of meeting some of the Chief Engineers of the British railways he was entertained last Wednesday at a luncheon given by Messrs. Sandberg, at which the following were present:—

Dr. C. C. Wang, Director of the Chinese Government Purchasing Commission; Sir Henry Maybury, G.B.E., President of the Institution of Civil Engineers; Major Charles E. Williams, Chief Inspecting Engineer, Crown Agents for the Colonies, and President of the Institution of Locomotive Engineers; Mr. R. Carpmuel, Chief Engineer, Great Western Railway; Mr. G. Ellson, Chief Engineer, Southern Railway; Mr. Arthur R. Cooper, Chief Engineer, London Passenger Transport Board; Mr. C. J. Brown, Chief Engineer, London & North Eastern Railway (Southern Area); Mr. H. N. Gresley, Chief Mechanical Engineer, London & North Eastern Railway; Mr. R. E. L. Maunsell, Chief Mechanical Engineer, Southern Railway; Mr. C. Y. Wu, of the Chinese Government Purchasing Commission; and Mr. Sah, Jun.

Mr. F. C. C. Stanley, Acting District Goods Manager, Liverpool, who, as announced in our issue of July 6, has been appointed London Suburban District Goods Manager at King's Cross, L.N.E.R., was born in 1900 and educated at Birkenhead School and Pembroke College, Oxford. He joined the former North Eastern Railway at York as a Traffic Apprentice in 1922



Mr. A. V. Venables, M.C., V.D., M.Inst.C.E., M.Inst.T., M.I.E. (India),
Appointed Agent, East Indian Railway

Queen's medal and five clasps. In 1902 he was employed on the Neasden-Northolt construction, Great Central Railway, but entered the East Indian Railway service as a junior engineer in the following year. In 1914 Mr. Venables joined the Indian Army Reserve of Officers, and in 1915 proceeded to France in the 20th Field Company, 3rd Sappers and Miners. Eight months later he went to Mesopotamia, and in April, 1916, was appointed Adjutant, Royal Engineers, 3rd (Lahore) Division. Ordered to Palestine in May, 1918, he was awarded the M.C. and mentioned

and gained experience in the Commercial and Operating Departments at various places, in what afterwards became the North Eastern Area of the L.N.E.R. At the end of 1926 he was transferred to the Chief General Manager's Office as Assistant to the Industrial Agent, where he remained until appointed Assistant to the Goods Manager, Southern Area, at Liverpool Street in July, 1929. After serving for three and a-half years at Liverpool Street, Mr. Stanley was appointed Acting District Goods Manager, Liver-



Mr. F. C. C. Stanley,

Appointed London Suburban District Goods Manager, King's Cross, L.N.E.R.

pool, in January, 1933. He now succeeds Mr. H. A. Newman at King's Cross, following the retirement of the latter at the end of June. Mr. Stanley is a Lieutenant in the 157th (Docks) Company, Royal Engineers, Supplementary Reserve.

Mr. C. K. Bird, who, as announced in our issue of July 6, has been appointed Assistant Goods Manager, Southern Area, L.N.E.R., was born in 1897. He was educated at King's School, Grantham, and St. John's College, Cambridge, where he was a mathematical scholar, and took First Class Honours in Part I of the Mathematical Tripos and was placed as Wrangler in Part II. Mr. Bird served during the war with the Honourable Artillery Company and the Royal Artillery, and joined the old North Eastern Railway in 1922, gaining experience in the Commercial and Operating Departments in the head offices at York, and subsequently at outside stations. In 1926 he was appointed Chief Staff Clerk to the District Superintendent at Leeds, and in 1928 to a similar post at Middlesbrough. In July, 1928, he was transferred to the Rates Office, York, where he represented the North Eastern Area on the Clearing House Classification and Container Committees. In 1929 Mr. Bird was appointed Head of the Rates



Major Charles E. Williams, C.B.E., M.I.Mech.E.,

Chief Inspecting Engineer, Crown Agents for the Colonies, who is retiring on August 1



Sir Herbert Walker (right) and Major Gilbert S. Szlumper (left)

A happy picture, reproduced from the *Southern Railway Magazine*, of the General Manager and Assistant General Manager, Southern Railway, at the recent opening of a new staff bowling green at Waddon

and Statistics section of the Chief General Manager's Office, and in 1932 also became responsible to the Chief General Manager for Parliamentary matters. This post he has now relinquished to become Assistant Goods Manager, Southern Area, with office at King's Cross, in succession to Mr. A. E. Sewell, who, as recorded in our issue of June 8 last, was recently appointed Goods Manager, Southern Scottish Area, L.N.E.R.

Major Charles E. Williams, C.B.E., M.I.Mech.E., Chief Inspecting Engineer to the Crown Agents for the Colonies, retires on August 1 after 30 years' service. He has accepted an appointment with the United Steel Companies. We reproduce opposite a recent portrait of Major Williams at his desk. A studio portrait and brief biographical sketch appeared on page 841 of our issue of June 23, 1933, when he was elected President of the Institution of Locomotive Engineers.

We regret to learn of the death on July 16, at Sydenham Lawn, Cheltenham, of Mr. Arthur Reginald Stuart, late Deputy Chief Engineer, Madras & Southern Mahratta Railway.

Mr. C. E. W. Duley, who has been Assistant to the General Manager of the Central Argentine Railway since 1930, is being transferred to London to take up the position of Assistant to the Secretary on September 1 next.

The result of the ballot to fill the vacancies that will occur in the Council of the Institution of Electrical Engineers on September 30 next includes, as President, the name of Professor W. M. Thornton, O.B.E., D.Sc., D.Eng.; and, as Vice Presidents, Mr. W. E. Highfield and Lt.-Col. A. G. Lee, O.B.E.

BRITISH STANDARD CONCRETE PIPES AND TUBES.—The British Standards Institution has recently issued a new specification relating to cement concrete cylindrical pipes and tubes (not reinforced) of nominal diameters of 6 in. and upwards. The specification ensures an appropriate quality for the concrete by the inclusion of requirements as to the cement and aggregate and the proportions of the mixture, and by hydraulic pressure, absorption and crushing tests. Owing to the many different processes by which concrete pipes are manufactured, it was not found practicable to standardise thicknesses, nor have the designs of the sockets of the O.G. and rebated ends been standardised in detail, but variations in the thickness of the walls of individual pipes is controlled, and such dimensional requirements as will secure interchangeability between pipes have been included. Copies of this specification (B.S.S. No. 556-1934) may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 2s. 2d. post free.

Completing the Canton-Hankow Railway

A history and description of the first railway construction which is to link up North and South China, by providing a trunk line through difficult and interesting country, 65 miles in length

By H. H. Ling, Director and Engineer-in-Chief, Chu-Shiu Section, Canton-Hankow Railway

The Canton-Hankow Railway, passing through the provinces of Hupeh, Hunan, and Kwangtung, is generally considered to be the most urgently needed railway in south China from both political and economic points of view. The first move for the construction of this line was made as long ago as 1898, and during subsequent years construction work was carried on from both ends under separate organisations, the southern section being extended by the then Yueh Han (Canton-Hankow) Railway Company, with its headquarters in Canton, and the northern section by the Administration of the Hupeh-Hunan Section, with headquarters in Wuchang, financed by a British loan as a part of the Hukwang agreements.

Construction Work Interrupted by the World War

In the north a section from Wuchang (opposite Hankow) to Changsha, a distance of 368 km. (230 miles), and in the south a section from Canton to Shaochow (Shiuchow), a distance of 225 km. (140 miles), were nearly completed when the World War broke out, interrupting the extension from both ends, and leaving a gap of about 452 km. (281 miles) unfinished. Of the two completed lengths, the Wuchang-Changsha section is as often as not operated at a loss on account of serious water competition. The Canton-Shiuchow section, although slightly better than the other, is also seriously affected by competing river transport and has difficulty in making ends meet. The delay of many years in the completion of this important trunk line has not only hindered political unification and the economic development of the nation, but also has prolonged the unremunerative period of working the two "dead-end" sections, which without the aid of through traffic between Northern and Southern China cannot be expected to pay. The principal reason for the long delay is financial, as the sum needed to complete the remaining 452 km. of line through difficult country was very large, and there was no point in extending piecemeal.

Work Resumed in 1929

Once the negotiations for the return of the British portion of the Boxer Indemnity to be used for construction and educational purposes were actually in train, the Ministry of Railways lost no time in ordering the resumption of construction work in 1929. In the latter part of that year, a construction

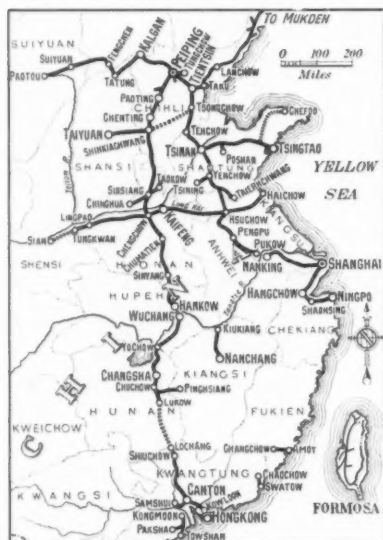
organisation was formed at Canton under a Director who was to be also the Engineer-in-Chief, to complete the central link in the route. A part of the Belgian Boxer Fund was first secured by the Railway Ministry, resulting in the purchase of rails, bridges, and a certain amount of rolling stock from Belgium for a section from Shiuchow to Lochang, a distance of 51 kilometres. Besides funds available for materials, the construction was further financed by the Southern Section Administration to the extent of \$100,000 a month out of its receipts, to meet labour and local material expenses, and actual work then began. Unfortunately, funds gradually became scarce, and work could go on only slowly until the summer of 1932, when it was again practically suspended. In the meantime, however, the negotiations between the Ministry of Railways and the Sino-British Boxer Fund Board for a loan sufficient to complete the whole line had made much progress, and pending final settlement of the agreements, an advance of \$700,000 was given in October, 1932, enabling work on the Shiuchow-Lochang section to be resumed and completed in September, 1933, when this section was handed over to the Southern Section Administration for operation.

The Shiu Lo Construction

This newly completed section has a length of 51 km. and links up the two prosperous cities, Shiuchow and Lochang, on the east bank of the North River. On it there is one tunnel 426 m. (1,400 ft.) long, the construction of which was begun in 1910, and up to the time of interruption of work a 215-ft. section at the north and 560 ft. at the south end had been driven. The tunnel goes through soft rock strata and is lined with concrete throughout. The major bridges in this section include the Shiuchow bridge, over the Nan Hsiung River, having one 60-m. through truss span, five 30-m., one 18-m. and one 10-m. girder spans. The rails used are 43-kg. of Chinese Government standard section, 10 m. in length, and the sleepers are of Australian and Siamese hardwood to resist the ravages of white ants. Local cement manufactured by the Sai Chuan Cement Works in Canton was first introduced, but on account of its high cost Haiphong Dragon Brand cement and Chee Hsin cement were also used.

On July 18, 1933, the Ministry of Railways and the Sino-British Board

administering the Boxer funds concluded a loan agreement, in which the board consented to allot to the Ministry of Railways the following sums for the completion of the Canton-Hankow Railway: (a) For purchase of materials in England, through the Chinese Government Purchasing Commission in London, £920,000 in cash and £740,000 in instalments from March, 1933, to December, 1936. (b) For work and local materials in China, £740,000 in instalments during the



Sketch map of the Chinese railways

period of construction, from March, 1933, to December, 1936, £500,000 to be redeemed prior to 1937 from previous loans made to the Ministry of Railways, and £1,600,000 in instalments from January, 1937, to December, 1946. As the latter sum will not be available during the construction period, it was further agreed that the Ministry should issue bonds amounting to £1,200,000 over a period of four years with these future instalments as securities.

It is estimated that from these allotments of funds the Ministry of Railways will be able to realise £1,660,000 for purchasing foreign materials and \$31,966,000 for work and native materials in the course of four years, besides interest on the capital to be paid as set forth in the loan agreements. This is all that can be made available out of the two-thirds of the total British Boxer Fund appropriated for railway purposes.

Work in Progress as Funds Available

Knowing that the loan agreement was about to be concluded before the Shiuchow-Lochang section was finished, the construction administration had already made preparations for a further extension of 62 km. from Lochang to the provincial border. This section of the line is perhaps the most difficult of

all, following the upper course of the North River and necessitating heavy rock cutting, tunnelling and construction of extensive retaining walls. The original location of this section, made by engineers of the Yueh Han Railway Company in 1913, required some sixty tunnels. Subsequent studies have made many improvements, and the line now adopted was located by Mr. Y. C. Lee, the present District Engineer, placing the line further out along the river, and thus greatly diminishing the amount of tunnelling at the expense of an increase of protection work. Following closely the North River, this difficult alignment has more than 60 per cent. of its length curved, the maximum curvature being $7^{\circ}.30' = 764$ ft. radius, but the gradients are comparatively easy, the maximum being 0.7 per cent. (1 in 143).

Tenders for the construction of five tunnels, the longest of which is 750 ft. in length, and for 2,300,000 cu. m. of earth and rock cutting, together with a large number of retaining walls—costing altogether about \$3,500,000—were called for in May, 1933. Later on, different contracts were awarded and various works begun in the first part of July of that year. Further contracts were awarded for bridges and culverts. Seven more tunnels, including one of 900 ft. and another one of 750 ft., were subsequently started early in 1934 with a certain amount of earth and rock cutting. The work in this whole section of 62 km. will eventually involve an expenditure of over seven million dollars, excluding that for foreign materials.

This length of 62 km. forms a divisional charge and is divided into four sections each in charge of a section engineer, while the divisional engineer also takes charge of one section and has his headquarters at Lochang. The construction of this division is very much handicapped by the inconvenience of transportation, for beyond

3½ YEAR-PLAN FOR THE COMPLETION OF THE CANTON-HANKOW RAILWAY. FROM JULY, 1933, TO DECEMBER, 1936, FOR A LENGTH OF 401 KM.

Districts	Length	1933	1934	1935	1936
No. 2. Lochang-Provincial Border ...	62 km.	(A) Main	Trackwork.	(B) Ballast	ing and Buildings
No. 3. Provincial Border-Tanling ...	48		(A)	(B)	
No. 4. Tanling-Kaoting ...	56			(A)	(B)
No. 5. Kungping-Kwanyinchao ...	74			(A)	(B)
No. 6. Kwanyinchao-Luichi ...	74		(A)	(B)	
No. 7. Luichi-Chuchow ...	87		(A)	(B)	

Lochang the North River goes into deep gorges through the mountain ranges, and there are only broken paths on the steep hill-sides close to the river. The river is extremely shallow in dry seasons, and within 40 km. north of Lochang there are no fewer than 18 rapids. Small boats with a draft of 18 in. can scarcely go over these rapids and then not infrequently meet with disaster. Thus the transportation of

men and material is exceedingly difficult, by land or by water. As the nature of the work requires a great deal of manual labour, it is estimated that no less than 15,000 men should be employed. As the contractors have to hire labourers in, and bring them from, Hunan, and then provide for them lodging places and ample food supply, this constitutes another difficult problem.

The rock formation is mainly composed of good limestone, either exposed or covered with a few feet of earth. Most of the rock cutting work is done with air compressor sets and dynamite. On account of the steep natural side slopes along the river, making the transportation of these machines exceedingly difficult, only portable compressors of light weight can as a rule be used. Air compressors of various makes, including Broom & Wade, Ingersoll Rand and Belgian and German products are now in use by the contractors. In many instances, these compressors are mounted on small boats moving up and down the river as required.

Although difficult from an engineering standpoint, this stretch of country is exceedingly beautiful, with its deep gorges, rapids, forests, waterfalls and rock caves. The accompanying illustrations show the work proceeding amid picturesque surroundings.

Work Started from Both Ends

The Chushao Construction Office had already made all preparations to start work also from the north end before the loan agreement was signed in July, 1933, and in September, 1933, the head office was moved from Canton, Kwangtung, to Hengchow, Hunan, which is centrally located, in order to be in closer touch with the two ends. The Chushao office is now making arrangements to complete the line through before the end of 1936, according to the following schedules:—

The section of 16 km. from Chuchow to Lukow in the northern end, built some years ago but never operated, is now being remodelled by raising the embankments and masonry structures and improving the grade. In the Northern Section there are three major bridges over the Lo Ho, Mi Ho, and Lei Ho, all tributary to the Hsiang Ho. Borings on these sites were begun before, and are now being further con-

tinued to obtain more information on foundations. On account of cheap land transport facilities and the possibility of navigation on the Hsiang Ho up as far as Hengchow for several months of the year, work will be started from Lukow and Hengchow at the same time towards the south in order to gain time.

Maximum Gradient

As the section of the line from Chuchow south to the Canton border was located first by British engineers in early years and again relocated by Mr. C. J. Carroll, Chief Engineer of the I-Kwei line, location parties are now driving down the final stakes ready for work. The early location used 1 per cent. maximum gradient, and Mr. Carroll used 0.7 per cent. maximum grade in his relocation. Much greater diversity of opinion on maximum grades is shown on the mountainous section over the provincial boundary for a distance of about 60 kilometres. Several surveys were run during early years, and among other proposed lines involving some prohibitive costs, the one known as the Dees Line seems to have received most attention. Mr. Dees, a British engineer of the Hupeh Hunan Section, located the line in 1913, following the Pei Sha Creek with a 1 per cent. maximum gradient. In 1931, two surveying parties were sent out for comparative studies by going along the Tien Tow Creek valley instead of Pei Sha, and by using an 0.7 per cent. maximum grade instead of 1 per cent. The results of these surveys revealed the necessity of sharp and long curves, heavy support and protection, much greater lengths and greater cost of construction.

As the question of maximum gradient should be considered in relation to the whole line, and not only to local significance, the construction office proposed to the Ministry of Railways early in 1933 to hold a joint conference of the three sections of the line (Canton-Shiuchow, Hupeh Hunan, and Chushao) to discuss the question as well as other important technical problems common to them all. Consequently a joint conference was held in Nanking in May, 1933, under the auspices of the Ministry of Railways, and among other questions it was decided that an 0.7 per cent. maximum grade and curvature of 300 metres radius should be fixed for the section from Chuchow to Chenchow, and that a maximum grade of 1.5 per cent. with compensation and sharper curvature might be allowed for the section from Chenchow to Lochang when necessary, subject to the approval of the Ministry of Railways. The maximum grade of the present Canton Lochang Section is 0.7 per cent. and that of the Wuchang Chuchow Section, going over comparatively easy country, is 1 per cent. Location surveys over this difficult section are now completed for a line

following partly the Dees line with broken 1 per cent. grades without compensation on both sides of the divide all within a distance of 20 km. just north of the provincial border. For the sake of careful comparison in view of the importance of the question, involving both cost of construction and economy of operation, further investigation over this section will be made before actual construction begins.

Foreign Materials

The Ministry of Railways has sent out several orders, through the Chinese Government Purchasing Commission in London, for rails, accessories, bridges, construction plant, &c., for the whole section. All rails and accessories are of 43 kg. Chinese Government Standard and 12 metres in length. Bridges of various spans are all of standard design of E-50 loading prepared by the Ministry of Railways. Locomotives and wagons both for passenger and freight service were also ordered. All locomotives are of a new type of 4-8-4, with a tractive effort of 17,500 kg., capable of attaining a speed of 80 km. an hour on level track and of hauling 1,000 metric tons at a speed of 25 km. an hour on a 1 per cent. up-grade. This will be the standard type of locomotives to be used on the Canton-Hankow line for some time to come.

Minimum Estimates

In view of the limited funds available for the completion of this important line, especially the funds to be used in China, it is desired to make a minimum estimate on the work with the object of completing the line with all the available resources, leaving, if necessary, all the less important or less urgently needed work to be completed later. Thus a soundly constructed railway with permanent structures of standard strength is required, with possibly temporary buildings and shops and equipment for immediate needs only. As funds for foreign materials are sufficient, more steel structures will have to be used in crossings where concrete bridges might otherwise prove more

advantageous or economical. Station sidings, loops, yards, &c., will be provided for immediate use with full reservations of land for further expansion.

The following estimate has accordingly been made, based on previous surveys and estimates, but with certain revisions of the price of materials and labour:—

MINIMUM ESTIMATES FOR THE CONSTRUCTION OF CHUCHOW-SHIUCHOW SECTION OF 401 KM. OF THE CANTON-HANKOW RAILWAY.

Items.	China Fund in Dollars	London Fund in Pounds Sterling
1. Earthwork, earth cutting and filling ...	3,850,600	
Rock cutting ...	6,908,500	
Retaining walls, &c. ...	2,132,100	
2. Tunnelling ...	2,398,300	
3. Bridges and culverts, masonry ...	4,895,500	
Steel construction ...	780,000	170,000
Culverts ...	1,853,900	
4. Right-of-way protection ...	35,850	
5. Telephone and telegraph ...	298,700	10,000
Train signals ...	119,500	
6. Track, sleepers ...	3,824,900	
Rails ...		329,120
Accessories ...		87,500
Track tools ...	20,000	1,000
Track laying and ballasting ...	1,129,200	
7. Points and crossings ...	20,000	28,000
8. Buildings, head office Station buildings and platforms ...	900,000	
Small shops and stores ...	38,900	3,000
Staff quarters and gang houses ...	478,000	
Water towers and pumps ...	150,000	12,500
Coaling stations ...	75,000	
Turntables ...	18,000	4,000
Weighbridges ...	8,000	4,000
9. Engine sheds and equipments ...	125,000	120,000
10. Rolling stock, locomotives ...		240,800
Passenger coaches ...		192,500
Freight cars ...		300,000
Locomotive cranes ...		10,000
11. Maintenance during construction ...	90,000	
12. Surveying and instruments ...	215,250	5,000
13. Land ...	1,135,000	
14. General expenses ...	3,000,000	
15. Contingencies ...	961,000	127,580
	\$35,511,200	£1,645,000

Exports of Railway Material from the United Kingdom in June

	June, 1934	June, 1933	Six Months Ending June, 1934	June, 1933
Locomotives, rail	£23,948	£43,246	£143,184	£523,350
Carriages and wagons	61,388	41,780	346,693	251,574
Rails, steel	177,721	80,870	421,195	285,903
Wheels, sleepers, fishplates and miscellaneous materials	126,400	86,455	456,015	383,670

The following table shows the distribution of locomotives and rail exports:—

	Locomotives June, 1934	June, 1933	Rails June, 1934	June, 1933
Argentina	—	2,550	5,773	1,479
Union of South Africa	—	—	58,748	20,977
British India	1,795	4,338	38,870	4,670

Air Survey in Relation to Railways*

Air survey is not just a series of vertical photographs fitted together in the form of a "mosaic," resulting in a photographic map; such a map would not be anything more than a caricature of the land so depicted. It was not until the great war that the method of gathering information from air photographs was used to any extent, and, although up to the present time very little use has been made of air survey by the railway companies of Great Britain, the time is fast approaching when surveying from air photographs will supersede to a considerable extent the older methods.

For purposes of plotting it is necessary that each photograph should show a strip of ground common to the two succeeding photographs. An overlap of 60 per cent. in a longitudinal direction will provide 20 per cent. for this purpose, which is sufficient. Further, for stereoscopic examination, which is most necessary, two photographs are required covering the area from two different points of view for which a minimum of 50 per cent. overlap is necessary.

At a height of 6,000 to 8,000 ft., probably the most suitable altitude for photography for railway surveys, the width of the film amply covers the required ground in most cases, so that the method employed is that known as "strip" photography. The aircraft is flown with the railway track as near as possible in the centre of the photograph.

If the ground being photographed were perfectly flat, the aircraft flying at a constant height and uniform speed in a straight line and without lateral tilt, and with the optical axis of the camera fixed exactly at right angles to the plane of flight, the result would be, apart from any distortion from lens or shutter, a series of overlapping photographs which could be joined together to form a true plan of the ground photographed to a scale depending upon the height of the aircraft above ground and the focal length of the lens used. This is the ideal which is aimed at, and a good pilot will certainly be able to keep the height more or less uniform and restrict tilt in the photographs to within two degrees in normal circumstances.

Ground Control

Some kind of control from the ground is necessary either in the form of natural features, fixed points such as buildings, or, if neither of these are available, specially constructed points. The relative positions of these points is established on the ground by ordinary survey methods, and they must be easily identifiable on the photographs, for faulty identification is equivalent to an error in fixing the points. Where

contouring is to be carried out height control is also required.

For railway surveys in this country dense control and a wide choice of control points is available, and in working to a scale of 1 : 1,584, which is the most useful one for general purposes, dense control is desirable. Experience shows that with a flight carried out at an altitude of 6,000 ft. control points should be fixed in ordinary circumstances at approximate intervals of 300 to 400 ft. parallel to the railway and at a distance from it of about 450 ft. on each side.

As to the actual selection of points, this needs some experience and discrimination on the part of the surveyor. An object which appears to be ideal for such a purpose may prove the reverse when photographed from the air, and it has been found that such objects as telegraph poles, lamp posts, signal posts, and the junctions of fences are more readily identified than, say, the corners of buildings which from the air are covered by the eaves, although the apex of the ridge of prominent buildings often proves a useful point.

Photographs

The type of photography adopted in an aerial survey is governed by the scale of the plan required. Oblique photographs can be applied in the construction of small scale maps for reconnaissance work and are taken from a considerable altitude, but for plans at large scales vertical photographs are necessary.

Normally, air survey is mainly concerned with cartographic features, but at a scale of 1 : 1,584 quite small details have to be correctly identified. No hard and fast rules can be laid down as a guide to the relationship between the various "tones," for the same object will appear different under varying conditions of lighting. For instance, water may appear in one print as white and in others as any "tone" between that and black, depending upon its depth, and the condition of its surface.

Shadows are often of great assistance, particularly such as are thrown by telegraph poles, lamp posts, and signal posts, for they enable the exact position of a point to be located, and for this reason such objects frequently prove useful as control points in large scale surveys.

When the photographs have served their purpose in making the survey they can be put to a variety of uses, for, as well as forming a valuable record of existing features at the time they were taken which will be accepted as legal proof, they are a great aid in interpreting plans on old documents, for it is often found that features not easily identified on the ground, such as the site of a grubbed-up hedge, photograph clearly on account of the different "texture" of the ground.

The current practice in this country for the purpose of preliminary discussion regarding new railways is to define the proposed line on a map of a comparatively small scale, and to supplement this by inspection on the ground and written report.

It is here that the new air methods should be of considerable assistance, and would enable the surveyor to view the scheme as a whole, save a good deal of time, and undoubtedly provide a valuable record of existing conditions on the ground. This latter point may not appear of great importance, but there is no doubt that if accurate records such as these of ground conditions at the time of purchase were possessed to-day, much tedious, not to mention costly, work involved in the settlement of questions of ownership of land would be avoided.

Making or Correcting a Plan

It is generally found in this country that plans of some description can be procured of an existing way, and it may, therefore, be thought that the necessity for making completely new plans from a fresh survey is a luxury not justified by the expense, and that the old survey revised would be sufficient to meet requirements. It should be realised that the origin of many of these plans is obscure and that through the passage of years the ground features have in many cases altered completely. Such plans require to be thoroughly tested on the ground, and unless proved accurate it is folly to attempt a revision.

Mr. Christy Clay described a survey carried out by the L.M.S.R. as an experiment early this year on a length of 1½ miles of the Southend line at Upminster. This section was chosen because the line had recently been widened and electrified from Barking to Upminster (a length of about eight miles), the station extended, new bridges and sidings constructed, while the general development outside the railway has been considerable. It was a fair sample of line from the point of view of cuttings and embankments, variations in levels, fences and hedges, &c., and, taking the form of an inverted "S," which made flying conditions rather difficult, it was felt that if a successful survey could be made by aerial means of this line many hundreds of miles of similar lines could be surveyed in the same way.

No reference was made to any existing plan for the purpose of plotting, the plan being constructed entirely from the air photographs. The times taken were:—

Fixing position of control points on the ground by the survey party...	25 hours.
Plotting and tracing control points and marking and preparing contact prints for photographer	8 "
"Plotting" from photographs	50 "
Examination on the ground of first reproduction taken from this plot for obscure detail and information not obtainable from photographs, with an assistant	21 "
Plotting this detail and adding information thus obtained	14 "

* Abstract of a paper read on July 18 at the Fifth International Congress of Surveyors in London, 1934, by Mr. W. H. Christy Clay, O.B.E., F.S.I.; Chartered Surveyor; Chief Estates Manager, L.M.S.R.

NOTES AND NEWS

Beautifying Canadian Railway Stations.—Approximately 150,000 flowering plants have been distributed from greenhouses at various centres for the floral decoration of stations and yards of the Canadian National Railways. The hardy geranium is the favourite plant, closely followed by petunias, snapdragons, and French marigolds.

Manchester Ship Canal Company.—Traffic receipts of the Manchester Ship Canal Company for the half-year ended June 30, 1934, amounted to £602,925, as compared with £574,959 for the corresponding period of last year, an increase of £27,966. The net revenue of the whole undertaking for the half-year (after providing for interest and fixed charges) was £43,870 more than for the corresponding half-year in 1933.

Mowatt Challenge Cup Competition, 1934, L.N.E.R. Southern Area.—The final match for the challenge cup presented by the late Rt. Hon. Sir Francis Mowatt, G.C.B., was played on the L.N.E.R. (Great Northern Section) athletic ground at Gordon Hill, on July 12, when a team from the Engineer's Department beat a team representing the Traffic Departments by 171 runs to 124 runs. The best individual performances were: *Batting*—F. R. Barnwell, Engineer's Department,

63 runs; P. H. Liddicoat, Traffic Departments, 48 runs. *Bowling*—N. Jackson, Engineer's Department, 6 for 39; J. Mahaffy, Traffic Departments, 6 for 67.

Diesels for Indo-China.—Five diesel railcars have been ordered for passenger service on the Yunnanfou Railway in Indo-China. They are to be equipped with 95 b.h.p. six-cylinder Saurer diesel engines, and the mechanical portions will be built in France. By their use it is hoped to increase the average speed between Haiphong and Hanoi to nearly 50 m.p.h., in place of the 25 m.p.h. of the present steam trains, and to reduce by half the journey time of two days between Hanoi and the railhead at Yunnanfou.

Rail Conveyance of Stretcher Patients.—An invention which marks another step forward in comfort facilities for rail transit for the disabled, and at last makes possible bed-to-bed transport, has been made by Mr. T. Parratt, an employee in the G.W.R. Carriage Department at Taunton, who has produced an improved type of stretcher designed primarily for the conveyance of invalids by train, and known as the Parratt stretcher. The new stretcher is of reduced width, fitted with a shock absorber bed, and patients loaded upon it at bedside may, without further

removal or unnecessary adjustment, arrive at their destination having travelled in the company of relatives or attendant in the comfort of a railway compartment. The appliance is fitted with sliding handles, fixed in a concealed position when not in use, which permit the stretcher being used in the ordinary way. A cross rail on each extreme end serves as an extra facility for carrying for short distances and in confined spaces, and four brackets, carrying the two cross rails, provide attachment for straps to secure the stretcher should it be necessary to load it on a motor ambulance, the straps being taken round the

handles of the lower stretcher and buckled. The inventor is a keen first-aid worker, and his invention is the outcome of his experience in connection with the transport of patients. The Great Western Railway has arranged for the patenting of the appliance, two of which will be retained at Paddington, while others will be available at the headquarters of each of the other traffic divisions of the railway.

Bill-posting on the L.N.E.R.—“Put it there and tell the world it pays to post on the L.N.E.R.” is the slogan of a large and highly-attractive coloured poster just issued by the company in question—“there” being a blank wall space indicated by the outstretched hand of a particularly jovial-looking bill-poster.

Road Motor Legislation in Northern Ireland.—The Motor Vehicles and Road Traffic Act (Northern Ireland), 1934, which was passed on June 28, consists of 56 sections and is divided into seven parts. Part 1 deals with safety and speed, Part 2 with third-party risks, and Part 3 with the licensing and regulation of goods vehicles.

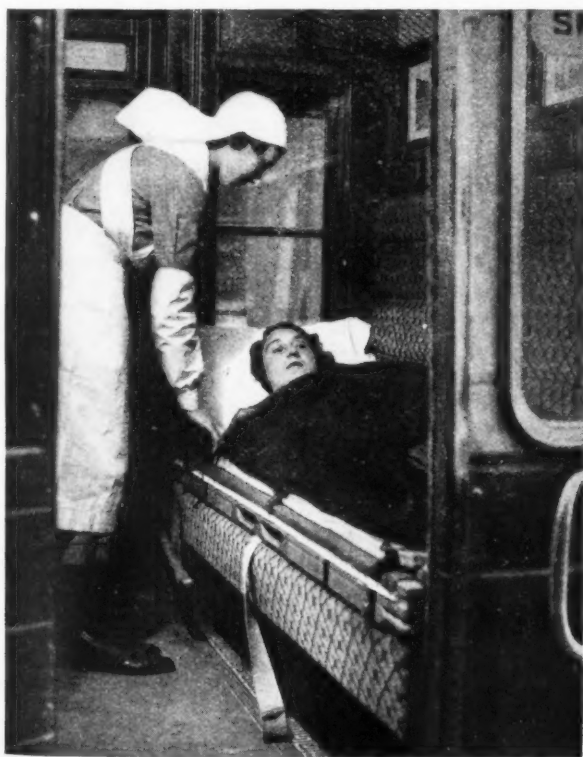
The Week's Road Accidents.—The Secretary to the Ministry of Transport has issued the following return, for the week ended July 7, of persons killed or injured in road accidents:—

	Killed in accidents reported during the week No.	Reported during the week as having died as the result of accidents occurring in previous weeks No.	Injured in accidents reported during the week No.
England	117	31	4,991
Wales ...	10	—	258
Scotland	21	1	529
	148	32	5,778

The total fatalities of the week as the result of road accidents were, therefore, 180, as compared with 139 in the preceding week. This figure of 180 is the highest recorded for a considerable time, even the week ended May 26, which included the Sunday and Monday of the Whitsun week-end, totalling only 147.

Combined Pullman and Dining Car, Central Argentine Railway.

The Central Argentine Railway has recently put into service, between Buenos Aires and Rio Cuarto via Pergamino, a new type of combined Pullman and dining car, constructed in the company's workshops at Rosario de Santa Fé. The interior of the vehicle, the general arrangement and equipment of which have been carefully studied and skilfully planned, comprises a kitchen, buffet, and dining car, and a Pullman section. The latter has seating accommodation for 10 passengers in single armchairs, handsomely upholstered in dark-blue leather. A small folding table, with a glass surface, is provided to each pair of facing chairs. The dining saloon is provided with 24 seats, and



A new stretcher which exactly fits in a railway compartment

contains two glass show cases, in which articles for sale are displayed. The general scheme of internal decoration has been designed on simple but pleasing and harmonious lines, as may be seen from the two illustrations which we reproduce on page 116.

London Transport (Finance) Act.—The Royal Assent was given on July 12 to the London Passenger Transport Board (Interim Financial Arrangements) Act, 1934.

Railway Wages Claim.—It has been arranged that the three railwaymen's trade unions shall meet the railway managers to-day (Friday), further to discuss the men's claim for the restoration of the wages existing prior to March, 1931.

First Railway Air Excursion.—Britain's first railway air excursion was run on Wednesday last, July 18, from Plymouth to Cardiff. A fare of 40s. was charged, as compared with the ordinary return fare of 65s., and the trip was limited to eight persons. From start to finish the trip lasted ten hours, two hours of which were spent in flying over 200 miles of land and sea.

New Midlands-South Coast Railway Air Service.—It is announced that Railway Air Services Limited will begin a new service between Birmingham, Bristol, Southampton, and Cowes, on July 30. The journey time will be two hours, and there will be two services a day in each direction. This service will provide a useful link at Birmingham with the existing Plymouth-Liverpool service.

Railway Developments in South Africa.—As part of the £10,000,000 South African Railways improvement scheme it is proposed to eliminate the reversing stations at Boscobello and Inkwelo and straighten the Natal main line to the Transvaal border, according to Reuters. This work will involve an expenditure of £250,000. The next step, it is believed, will be the electrification of Rand lines with an extension to Witbank, and finally an all-electric route from Durban to Johannesburg. Including the line from Diamana to Harrismith, which is to be completed about the middle of December, there are already 260 miles of electrified route in Natal. When the Durban-Volksrust scheme is completed, another 121 route miles will be added.

Railway Stockholders and Net Revenue.—At the recent annual meeting of the Scottish Railway Stockholders' Protection Association in Glasgow, Mr. G. T. Neilson, who presided, said that to reach the desirable and strictly reasonable position of paying all the debenture, guaranteed and preference stocks in full, plus 4 per cent. on the ordinary, of the four group companies, would require approximately £16,400,000 over the net revenue of 1933. It was not the railway employee who was suffering hardship, but those stockholders who for years had received no return on their investment. It was only by having a really strong and efficient

tribunal to deal with wages and conditions of service that lasting peace and confidence could be established in labour affairs.

Polish Floods.—Railway communication has been suspended between Cracow and Lwow (Lemberg) and almost the entire southern railway system disorganised by floods following torrential rains early this week.

Dust-laying Locomotives in Canada.—Nearly 200 locomotives of the Canadian National Railways are being equipped with track sprinklers to lay the dust ahead of passenger cars, and smoke deflectors to keep the smoke out of the eyes of train crews and passengers.

G.W.R. Parcels Train Speed-up.—Greatly improved express parcels services between the Midlands, the West of England and South Wales were introduced on July 9. From Birmingham a new late parcels train leaves at 9.50 p.m. for Cheltenham and Swindon, where it connects with other express parcels trains to South Wales and the West of England. Accelerations of as much as two hours are afforded in some cases.

Telephone Circuits.—The Westinghouse Brake & Saxby Signal Co. Ltd. has recently introduced a battery eliminator for operating telephone circuit apparatus direct from a.c. mains, entirely eliminating the battery. These units comprise a double-wound transformer with primary tapplings for supplies between 200/250 volts 40/100 cycles, and secondary taps for either 4, 5 or 6 volts d.c., separate rectifiers and smoothing circuits being provided for both speech and ringing circuits. The whole apparatus is mounted in a neat metal case arranged for wall mounting.

L.M.S.R. Signalling Reorganisation at Hebden Bridge.—An important local scheme of signalling reorganisation is to be carried out by the L.M.S.R. in the near future at Hebden Bridge (Yorks), where one signal-box will displace the two now in use. The passenger station and goods sidings are at present controlled by two boxes, East and West, situated 541 yards apart. By the use of electric track-circuits the whole of the points and signals now worked by the two boxes will be worked from the East box only. A small ground-frame of two levers, electrically controlled from the East box, will be used to work the connection from the line from Mytholmroyd to the siding near the present West box.

Collegewood—The Last Brunel Timber Viaduct.—The last of Brunel's famous timber viaducts, that at Collegewood, near Penryn, on the Falmouth branch, will be crossed for the last time on Saturday next, July 21, when the 10.50 p.m. train leaves Falmouth for Truro. On Sunday all trains will use the new stone structure which has been built alongside, and the work of demolition will be begun. Collegewood is the last and longest of some eighty similar bridges which have been replaced by

masonry structures or embankments. It has fifteen spans, is 974 ft. in length, and was originally constructed by the Cornwall Railway, when that line was extended to Falmouth in 1863 by the opening of a branch line from Truro.

Railcars for Tunis.—The French Government, putting into immediate effect the measures proposed by the Tunis Railways to lessen the cost of running the system, has decided to put into service 20 railcars to take the place of steam passenger trains, according to a Reuters Trade Service message from Tunis.

Rail Manufacture in Latvia.—A rail rolling mill has been opened by the wire factory at Libau, according to Reuters. The factory has received an order from the Latvian Minister of Communications for rails of light type for the new line from Alschwangen to Goldingen; delivery of 1,200 tons has to be made by August 1. Heavy type rails for the Riga-Dünaburg line have been ordered by Latvia from Poland.

Proposed Road Across Panama.—The United States Government proposes to authorise the construction of a road across the Isthmus of Panama, connecting the Atlantic and Pacific coasts. Hitherto, canal, railway, and air services have been available, but the building of a road has been opposed by the Panama Railroad Company, which obtained a monopoly for transport across the Isthmus more than 75 years ago.

L.M.S. Locomotive "The South Staffordshire Regiment."—The L.M.S.R. "Royal Scot" class express locomotive No. 6143 is to be named *The South Staffordshire Regiment*. This will be the 47th out of 70 engines comprising the "Royal Scot" class to be named after famous fighting units. Previously No. 6143 has carried the name *Mail*, after an old single-driver of this name, built for the Midland Counties Railway in 1840 by Robert Stephenson & Co.

Indian Tariffs on Iron and Steel.—Recommendations of great interest to the British iron and steel industry are contained in the report of the Indian Tariff Board, which was released for publication on July 11. Among the principal recommendations, according to Reuters, are:—Agreement between the Railway Board and the Indian Steel industry for the supply of all rails and fish plates; a duty of 40 rupees per ton on iron and steel structures so long as the "unfair" competition of "integrated" United Kingdom firms continues; every effort to be made to utilise the resources of India for the construction of the new Howrah bridge; protective duties of 7 annas per cwt. in addition to revenue duties on dog-spikes, gibs, cotters, keys and other rail fastenings imported from the United Kingdom, and of 2 rupees and 15 annas when from other countries; commercial bolts and nuts, rivets and fishbolts and nuts free from the United Kingdom, but various duties when from other countries.

OFFICIAL NOTICES

ENGINEER, 36, experienced in electrical, diesel, railway and road transport work and management. M.Eng., A.M.I.E.E., A.M.Inst.T., Member Diesel Engine Users' Association. Fluent Spanish. Seeks better position or representation.—Box 14, c/o THE RAILWAY GAZETTE, 33, Tothill Street, Westminster, S.W.1.

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OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

CONTRACTS AND TENDERS

Ransomes, Sims & Jefferies Limited has received advice from its agents in South Africa that the South African Railways & Harbours Administration is placing a contract with them for 53 welded frame trailers. Of these, 28 are of two-tons capacity and the remainder will be five-tonners. It will be remembered that not long ago Ransomes supplied 41 five- and seven-tonners to the same Administration.

Colonial Orders

The following orders have recently been placed by the Crown Agents for the Colonies:—

P. & W. MacLellan Limited: Angle irons and mild steel reinforcement.
Sir Wm. Arrol & Co. Ltd. and Alex. Findlay & Co. Ltd.: Bridgework.
Robt. Hudson Ltd.: Decauville tracks and wagons.
Electric Construction Co. Ltd.: Electric motors.
Ruston-Bucyrus Limited: Excavator and spares.
North British Locomotive Co. Ltd.: Locomotive boiler.
R. & W. Hawthorn, Leslie & Co. Ltd.: Locomotive boilers.
Kitson & Co. Ltd.: Locomotive boilers for reconditioning.
Stewarts and Lloyds Limited: Pipes.
Mather & Platt Limited: Pumping plant.
J. Shaw Limited: Steel wire ropes.
I.C.I. Metals Limited: Sheet copper strip.
Horsley Bridge and T. Piggott Limited: Steel framework.
Wolverhampton Corrugated Iron Co. Ltd.: Steel sheets.
Braithwaite & Co. (Engineers) Ltd.: Steel tank.
Johnson & Phillips Limited: Transformers.
Wellington Tube Works Limited: Water tubes.
Billington & Newton Limited: White metal.
Whitcross Co. Ltd.: Copper wire.
R. Johnson & Nephew Limited: Copper and bronze wire.

Orenstein & Koppel A.G. has received an order from the Argentine Ministry of Public Works for two locomotives for use in the Port of Buenos Aires.

Heatly & Gresham Limited has secured orders from the Indian Stores Department for 320 railway carriage fans, 135 regulators and 40 sets of fan blades.

The United Steel Companies Limited (Workington Iron and Steel Branch) has received an order from the Southern Railway for 3,000 tons of 95-lb. Sandberg-sorbittic rails.

H. J. Skelton & Co., on behalf of Usines et Boulonneries de Mariemont, has received an order from the Buenos Ayres Western Railway for 34,000 screw spikes for cast-steel chairs.

Leyland Motors Limited has received an order from the South African Railways & Harbours Administration for six Terrier goods vehicles one of which is to be equipped with a Leyland oil engine.

Contracts for steel for the ports of Buenos Aires, Mar del Plata, Quequen, Bermejo, and others have been awarded to Kreglinger and Van Peborgh (176,060 Belgian francs); United States Steel Products Company (\$32,907) and the British Structural Steel Co. Ltd. (£2,490).

Howell & Co. Ltd. has received an order from the Central Argentine Railway for 450 solid-drawn steel superheated flue tubes, 250 being Aquadiox quality and 200 Howco Zined. Orders have also been received from the Great Western of Brazil Railway for a total of 1,700 solid-drawn black steel boiler tubes, Aquadiox quality.

The Chinese Government Purchasing Commission has placed orders for about 174 sets of crossings and switches with the Anderston Foundry Co. Ltd., and 16 km. of light track with Robt. Hudson & Co. Ltd. This equipment is required for the Canton-Hankow Railway, and is being supplied to the inspection of the consulting engineers, Messrs. Sandberg.

John I. Thornycroft & Co. Ltd. has received an order from the Ramleh Electric Railways, Alexandria, for five 26-seater buses of special construction. With a 17 ft. 4 in. wheelbase, 8.25 in. low-pressure tyres and Thornycroft's latest 100-h.p. six-cylinder petrol engine, these vehicles should have a very fine road performance, as well as good riding qualities. The seating layout will be somewhat on the lines of the vehicles already operating in large numbers in Egypt, but accommodation in this case is being provided for seven first class and nineteen second class passengers.

Japan Gets an Order from India

The Great Indian Peninsula Railway has placed orders with Marker Goldsteane & Co. for 8,900 track bonds to be manufactured by Furukawa Electric Co. Ltd., Tokyo, and with Kilburn & Co. for 5,000 copper rivets to be manufactured by Ohio Brass Company, Ohio.

According to messages received on the Continent from Mukden, the Government of Manchukuo has decided to order new wagons and engines for the Manchurian railways from Japanese engineering works. The value of the orders is said to amount to about 1,500,000 yen.

Tenders are invited by the Chief Engineer, Bengal & North Western

Railway, receivable at Gorakhpur by July 25, for eight spans of 80-ft. metre-gauge girders of British or Indian manufacture.

Tenders are invited by the Agent, Bengal-Nagpur Railway, receivable by August 6 in the office of the Controller of Stores, Garden Reach, for 22,000 broad gauge steel sleepers for 90-lb. old B.S., alternatively 85-lb. rails.

The Clyde Crane & Engineering Co. Ltd. has secured an order from the South Indian Railway for one 1-ton electric coaling crane for locomotives, to the inspection of the consulting engineers, Messrs. Robt. White & Partners.

A delegation representing the Soviet Machine Tool Import Trust has arrived in London, with the object of purchasing machine tools for Soviet industry, states Reuters. Negotiations for the purchase of railway material from British firms, which began some months ago, are still proceeding and it is hoped that the contracts will be arranged at an early date.

The Purchasing Agent, Sudan Government Railways, Wellington House, Buckingham Gate, London, S.W.1, invites tenders, receivable by August 30, for 80,000 tons of colliery-screened coal, Welsh, Newcastle and Durham, &c., or Natal, required from October, 1934, to May, 1935.

The Egyptian State Railways Administration invites tenders, receivable on the dates named, as follow:—

Receivable at the office of the Superintendent of Stores, Saptieh, Cairo: 170 engine tyres, 3 ft. 2 $\frac{1}{4}$ in. diam., and 80 tyres, 4 ft. 6 $\frac{1}{2}$ in. diam. (August 2); 1,680 truck springs (August 18); six bogie frames (August 21); 240 axles for four- and six-wheeled carriage and wagon stock (August 22).

Receivable at the General Management, Cairo station: 480 wagon tyres (August 23).

Forthcoming Meetings

July 20 (Fri.)—**Egyptian Delta Light Railways** (Ordinary General), Winchester House, Old Broad Street, E.C., at 12 noon.

July 25 (Wed.)—**Bombay, Baroda & Central India Railway** (General), Southern House, E.C., at 1 p.m.

July 26 (Thurs.)—**La Guaira & Caracas Railway** (Ordinary General), Dashwood House, 69, Old Broad Street, E.C., at 12.30 p.m.

July 26 (Thurs.)—**Dorada Railway** (Ordinary General), Dashwood House, 69, Old Broad Street, E.C., at 2.30 p.m.

British and Irish Railway Traffic Returns

GREAT BRITAIN	Totals for 28th Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
L.M.S.R. (6,940½ mls.)	£	£	£	£	£	£
Passenger-train traffic...	627,000	617,000	+ 10,000	12,310,000	12,169,000	+ 141,000
Merchandise, &c. ...	433,000	416,000	+ 17,000	12,426,000	11,358,000	+ 1,068,000
Coal and coke ...	179,000	187,000	- 8,000	6,447,000	6,159,000	+ 288,000
Goods-train traffic ...	612,000	603,000	+ 9,000	18,873,000	17,517,000	+ 1,356,000
Total receipts ...	1,239,000	1,220,000	+ 19,000	31,183,000	29,686,000	+ 1,497,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic...	403,000	395,000	+ 8,000	7,899,000	7,828,000	+ 71,000
Merchandise, &c. ...	291,000	289,000	+ 2,000	8,637,000	7,803,000	+ 834,000
Coal and coke ...	208,000	206,000	+ 2,000	6,405,000	5,799,000	+ 606,000
Goods-train traffic ...	499,000	495,000	+ 4,000	15,042,000	13,602,000	+ 1,440,000
Total receipts ...	902,000	890,000	+ 12,000	22,941,000	21,430,000	+ 1,511,000
G.W.R. (3,750 mls.)						
Passenger-train traffic...	249,000	252,000	- 3,000	5,093,000	5,134,000	- 41,000
Merchandise, &c. ...	178,000	170,000	+ 8,000	4,968,000	4,564,000	+ 404,000
Coal and coke ...	87,000	90,000	- 3,000	2,785,000	2,750,000	+ 35,000
Goods-train traffic ...	265,000	260,000	+ 5,000	7,753,000	7,314,000	+ 439,000
Total receipts ...	514,000	512,000	+ 2,000	12,846,000	12,448,000	+ 398,000
S.R. (2,176 mls.)						
Passenger-train traffic...	340,000	325,000	+ 15,000	7,613,000	7,506,000	+ 107,000
Merchandise, &c. ...	62,500	62,500	-	1,746,000	1,662,500	+ 83,500
Coal and coke ...	25,500	28,500	- 3,000	881,000	816,500	+ 64,500
Goods-train traffic ...	88,000	91,000	- 3,000	2,627,000	2,479,000	+ 148,000
Total receipts ...	428,000	416,000	+ 12,000	10,240,000	9,985,000	+ 255,000
Liverpool Overhead ...	1,161	1,223	- 62	31,208	30,789	+ 419
(6½ mls.)						
Mersey (4½ mls.) ...	4,126	3,851	+ 275	115,443	110,322	+ 5,121
*London Passenger Transport Board ...	537,100	487,400	+ 49,700	1,089,200	987,500	+ 101,700
IRELAND						
Belfast & C.D. pass.	6,581	6,239	+ 342	64,260	65,149	- 889
(80 mls.)						
" " goods	394	408	- 14	14,645	14,742	- 97
" " total	6,975	6,647	+ 328	78,905	79,891	- 986
Great Northern pass.	18,650	15,850	+ 2,800	244,100	165,150	+ 78,950
(562 mls.)						
" " goods	7,350	7,150	+ 200	228,450	156,500	+ 71,950
" " total	26,000	23,000	+ 3,000	472,550	321,650	+ 150,900
Great Southern pass.	33,706	27,809	+ 5,897	615,213	589,900	+ 25,313
(2,158 mls.)						
" " goods	28,635	27,061	+ 1,574	897,734	838,721	+ 59,013
" " total	62,341	54,870	+ 7,471	1,512,947	1,428,621	+ 84,326

* 2nd week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year.

L.N.E.R. Evening Excursions

Something approaching 150 schedules have, we understand, been arranged by the L.N.E.R. for the running of cheap evening trips to a large number of popular seaside and country resorts from thickly-populated areas. These "fine weather trains" leave between 5.0 and 6.0 p.m. arriving an hour later and returning between 10.30 and 11 p.m., cheap fares ranging from 9d. to 2s. being charged. Extra trains are run whenever possible where the need arises.

Examples of these evening trips are Peterborough and Grantham to Skegness; Grimsby Town to Mablethorpe; Liverpool Street, Ilford and Seven Kings to Southend-on-Sea; Norwich to Yarmouth; Colchester to Clacton; Hull and Leeds to Bridlington; York to Harrogate; Leeds to Knaresborough; Leeds to Scarborough; Blackhill to Whitley Bay; Middlesbrough and Dar-

lington to Redcar; Hartlepool to South Shields; Newcastle to Hexham and Durham.

Further north these fine weather evening trips are being run from Edinburgh to North Berwick, Dunbar and Dunfermline; Selkirk to Portobello; Hawick to Tweedmouth; St. Boswells to Berwick; Langholm to Carlisle; Glasgow to Edinburgh; Bo'ness to Aberdour; Lennoxton to Cardross; Dundee to Aberdeen; Arbroath to Stonehaven; Perth to St. Andrews; Leven to Dunfermline; and Aberdour to Dundee—to name only a few.

On a recent Sunday some 5,000 people were taken from Sheffield to Cleethorpes and back for a few hours by the sea. Another very popular trip is that between London (Liverpool Street) and Southend-on-Sea where six trains were run one Sunday evening recently carrying 4,349 passengers.

British and Irish Railway Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices	
			July 18, 1934	Rise/ Fall
G.W.R.				
Cons. Ord. ...	55½	31	52	-1½
5% Con. Prefce. ...	109½	69½	113½	—
5% Red. Pref. (1950) ...	109½	87½	110½	+1
4% Deb. ...	108½ ¹⁶	99½	106½	—
4½% Deb. ...	108	100½	108½	—
4½% Deb. ...	116	106	115½	—
5% Deb. ...	128	117½	126½	—
2½% Deb. ...	65	60	69½	—
5% Rt. Charge ...	124	111½	125½	—
5% Cons. Guar. ...	122	103	123½	—
L.M.S.R.				
Ord. ...	297½	12½	23	-1
4% Prefce. (1923) ...	51	17	49	-2
4% Prefce. ...	72	33½	80½	-1½
5% Red. Prf. (1955) ...	93	47¼	100½	—
4% Deb. ...	103¼	89½	102½	—
5% Red. Deb. (1952) ...	114	105	111½	—
4% Guar. ...	97¼	68½	100	—
L.N.E.R.				
5% Pref. Ord. ...	22½	7¾	17½	-¾
Def. Ord. ...	10½	4½	8¼	-¾
4% First Prefce. ...	65½	19½	66½	-2
4% Second Prefce. ...	40½	12¼	33	-2
5% Red. Pref. (1955) ...	83½	27	85½	-½
4% First Guar. ...	94½	58¼	95	—
4% Second Guar. ...	89¼	48	90½	—
3% Deb. ...	77	60¼	76	—
4% Deb. ...	102¾	80	101	—
5% Red. Deb. (1947) ...	112	102½	109½	+1
4½% Sinking Fund Red. Deb. ...	107½	98½	107½	+1
SOUTHERN				
Pref. Ord. ...	71	27¾	80	—
Def. Ord. ...	24¾	9½	25½	-1
5% Prefce. ...	107½ ¹⁶	74	113	—
5% Red. Pref. (1964) ...	107¾	78½	111½	—
5% Guar. Prefce. ...	124¼	102¾	124½	—
5% Red. Guar. Pref. (1957) ...	115½	103½	114½	—
4% Deb. ...	107½	96¾	104½	—
5% Deb. ...	126½	114¼	126½	—
4% Red. Deb. ...	107¼	100	107½	—
1962-67				
BELFAST & C.D.				
Ord. ...	6	4	5	—
FORTH BRIDGE				
4% Deb. ...	99½	95½	101½	—
4% Guar. ...	98½	94	100½	—
G. NORTHERN (IRELAND)				
Ord. ...	7½	3½	5	—
G. SOUTHERN (IRELAND)				
Ord. ...	28	16	14	—
Prefce. ...	24	12½	15¾	-1¼
Guar. ...	42	16¾	46	+2
Deb. ...	60	30½	62½	-¾
L.P.T.B.				
4½% "A" ...	117½	112	117	—
5% "A" ...	127¼	119¼	127	—
4½% "T.F.A." ...	111¼	106	109	—
5% "B" ...	122½	114	121	—
5% "C" ...	86½	74½	81½	—
MERSEY				
Ord. ...	16¼	5	13½	—
4% Perp. Deb. ...	83	63½	86½*	—
3% Perp. Deb. ...	62	51	64½*	—
3% Perp. Prefce. ...	50½	27	52½	—

* ex-dividend

BRITISH RAILWAY STATISTICS

"The Railway Gazette" monthly table of freight and passenger traffic figures for April, 1934, as compared with the corresponding period in 1933, compiled from the Ministry of Transport Statement No. 173

Description	Great Britain*	Great Western	London & North Eastern	London Midland & Scottish	Southern
PASSENGER TRAIN TRAFFIC—					
Number of passenger journeys (excluding season-ticket holders)	93,206,827	6,844,882	13,289,424	21,967,281	16,526,572
Increase (+) or decrease (—)	373,191	526,009	498,437	782,976	463,302
Passenger receipts (excluding season-ticket holders)	£3,476,925	£455,645	£677,518	£1,065,059	£761,077
Increase (+) or decrease (—)	£645,429	£123,495	£138,337	£236,242	£153,741
Season-ticket receipts	£921,329	£62,474	£164,276	£244,731	£291,979
Increase (+) or decrease (—)	£136,239	£10,416	£13,411	£24,611	£53,303
Parcels and miscellaneous traffic receipts (excluding parcels post)	£1,044,445	£188,210	£302,694	£400,931	£128,332
Increase (+) or decrease (—)	£7,447	£2,705	£8,298	£9,672	£588
FREIGHT TRAIN TRAFFIC—					
Freight traffic (tons) (excluding free-hauled)	20,439,839	4,831,346	9,385,803	9,523,693	1,213,701
Increase (+) or decrease (—)	+ 2,306,356	+ 389,767	+ 1,348,148	+ 1,129,748	+ 86,719
Net ton-miles (excluding free-hauled)	1,147,167,125	208,813,119	389,361,553	466,861,792	49,879,952
Increase (+) or decrease (—)	+ 176,270,074	+ 26,435,336	+ 67,051,453	+ 73,884,770	+ 3,960,968
Average length of haul (miles) (excluding free-hauled)	56.12	43.22	41.48	49.02	41.10
Increase (+) or decrease (—)	+ 2.58	+ 2.07	+ 1.38	+ 2.20	+ 0.35
Freight traffic receipts	£6,384,956	£1,082,000	£2,098,000	£2,649,000	£350,709
Increase (+) or decrease (—)	£902,066	£104,000	£198,500	£267,000	£12,199
Receipts per ton-mile	1.336d.	1.24d.	1.23d.	1.36d.	1.69d.
Increase (+) or decrease (—)	— 0.093d.	— 0.04d.	— 0.12d.	— 0.09d.	— 0.08d.
Freight train-loads—					
Average train-load (tons)	127.65	131.66	135.08	125.05	101.54
Increase (+) or decrease (—)	+ 9.37	+ 7.13	+ 9.98	+ 10.35	+ 3.38
Net ton-miles—					
Per train engine-hour	1,019.70	1,077.94	1,071.28	990.70	805.84
Increase (+) or decrease (—)	+ 28.78	+ 44.82	+ 39.30	+ 9.79	+ 16.54
Per shunting-hour	869.77	798.94	955.16	897.86	550.52
Per total engine-hour	469.39	458.85	504.95	471.00	327.08
Net ton-miles per route-mile per working day	2,741	2,676	2,955	3,223	1,146
Increase (+) or decrease (—)	+ 408	+ 332	+ 491	+ 492	+ 99
Wagon-miles, Total	334,628,692	60,961,085	115,497,312	139,406,742	16,681,986
Increase (+) or decrease (—)	+ 38,526,486	+ 6,764,676	+ 14,856,637	+ 15,349,148	+ 1,281,276
Percentage of loaded to total	66.15	67.29	63.43	68.05	65.42
Wagons per train—					
Total	35.06	35.53	35.74	34.86	32.20
Increase (+) or decrease (—)	+ 1.31	+ 1.33	+ 1.27	+ 1.38	+ 0.78
Loaded	23.19	23.91	22.67	23.72	21.06
Empty	11.87	11.62	13.07	11.14	11.14
Train-miles, Coaching—					
Per train-hour	15.05	13.87	14.11	14.53	17.61
Per engine-hour	11.97	10.96	10.97	10.95	14.33
Train-miles, Freight—					
Per train-hour	9.40	9.93	9.30	9.28	9.67
Per engine-hour	3.68	3.51	3.79	3.77	3.16
Engine-miles, Total	43,271,021	6,779,379	11,874,400	16,012,962	5,817,774
Increase (+) or decrease (—)	+ 2,082,503	+ 295,123	+ 701,249	+ 928,745	+ 142,482
Mileage run by engines, Total train-miles—					
Coaching	21,658,675	2,926,646	4,953,436	6,955,408	4,248,809
Freight	9,544,931	1,715,842	3,231,683	3,998,994	518,019
Engine-hours in traffic, Total	4,601,570	780,567	1,372,285	1,779,672	478,556
Increase (+) or decrease (—)	+ 294,956	+ 35,596	+ 99,292	+ 143,021	+ 15,922
Shunting miles per 100 train-miles—					
Coaching	7.62	7.07	6.54	8.51	8.15
Freight	73.38	82.06	69.57	69.08	97.42

* All-standard-gauge railways

Passenger Traffic Statistics: Number of Journeys, Receipts, and Receipts per Journey (excluding Season-Ticket Holders)—April, 1934

Subject	Great Britain	Great Western	London & North Eastern	London Midland & Scottish	Southern	Cheshire Lines Committee	Liverpool Overhead	London Passenger Transport Board†	Mersey
Full fares—									
Passenger journeys	28,812,878	750,906	1,175,766	1,716,970	2,698,773	22,800	134,059	22,458,370	82,307
Gross receipts	£875,492	£85,404	£121,149	£139,016	£191,129	£3,206	£1,418	£317,329	£1,463
Receipts per passenger journey	7.05d.	27.30d.	24.73d.	19.43d.	17.00d.	33.75d.	2.54d.	3.39d.	4.27d.
Reduced fares—									
Excursion and week-end—									
Passenger journeys	36,350,171	3,981,609	8,045,540	12,793,064	8,231,360	388,546	132,559	1,143,112	641,142
Gross receipts	£2,035,433	£310,673	£452,570	£750,497	£432,100	£24,328	£1,129	£25,235	£9,357
Receipts per passenger journey	13.44d.	18.73d.	13.50d.	14.08d.	12.60d.	15.03d.	2.04d.	5.30d.	3.50d.
Workmen—									
Passenger journeys	23,573,180	1,713,963	3,139,049	6,453,023	4,910,738	233,074	176,286	5,912,130	181,480
Gross receipts	£339,610	£25,045	£49,940	£102,064	£80,665	£3,987	£1,425	£64,644	£1,670
Receipts per passenger journey	3.46d.	3.51d.	3.82d.	3.80d.	3.94d.	4.11d.	1.94d.	2.62d.	2.21d.
Other descriptions—									
Passenger journeys	3,467,048	397,722	928,267	1,002,690	685,207	40,512	1,120	334,673	10,571
Gross receipts	£220,954	£33,427	£52,341	£71,268	£56,612	£2,643	£5	£2,750	£137
Receipts per passenger journey	15.30d.	20.17d.	13.53d.	17.06d.	19.83d.	15.66d.	1.07d.	1.97d.	3.11d.
Total—									
Passenger journeys	93,206,827	6,844,882	13,289,424	21,967,281	16,526,572	684,968	444,024	29,848,285	915,500
Gross receipts	£3,476,925	£455,645	£677,518	£1,065,059	£761,077	£34,199	£3,977	£409,958	£12,627
Receipts per passenger journey	8.95d.	15.98d.	12.24d.	11.64d.	11.05d.	11.98d.	2.15d.	3.30d.	3.31d.

† Includes passengers originating on the railway undertakings, and on the Whitechapel and Bow Joint Railway

Railway Share Market

The stock and share markets have attracted less attention during the week, and as the next Stock Exchange account, commencing on Monday, is for three weeks and includes the Bank Holiday period, there is a disposition to think business may decrease further in volume. It is, possible, however, that an exception may have to be made in the case of the home railway market, which is awaiting with particular interest this time the interim statements of the companies to be issued on Thursday and Friday next.

Notwithstanding the present holiday exodus of Stock Exchange members, these statements will be subjected to close analysis, and if there should be official confirmation of recent market expectations of increased net revenue, a spirited upward movement may develop in home railway and junior preference stocks. The

market is not unforgetful of the warning which was given by directors that the rate of economies effected cannot be maintained at anything approaching the same ratio as in the past year, but the recent trend of traffic receipts has encouraged an optimistic view. This accounts for the steady absorption of stocks like Great Western ordinary, Southern preferred and deferred, L.M.S. 1923 preference and ordinary and L.N.E. second preference and preferred ordinary, all of which it is thought should be brought within sight of a dividend if the interim statements indicate a continuation of last year's favourable trend of net revenue. The wages discussion has temporarily fallen into the background as an influence on market values, and dealers in home railway stocks continue to anticipate a satisfactory mutual settlement of this recurrent trouble. Traffic receipts made a favourable impression, as it is borne in mind

that current takings compare with increases shown in the corresponding weeks of last year, when relatively good earnings were being recorded. London Passenger Transport Board's "C" stock has not fully maintained the rise of last week, which it is now thought was based on over-optimistic estimates of dividend. In foreign railway stocks there has been a dull tone in Argentine stocks, but the amount of selling is small, as brokers are inclined to recommend their clients to retain the stocks now that traffic receipts point to an appreciable improvement.

Buenos Ayres and Pacific first and second debenture stocks were a depressing feature, the prices being lowered $\frac{3}{4}$ and $2\frac{1}{2}$ points respectively early in the week. About £100 nominal of each of the first 4 per cent. debenture stocks of the four leading Argentine railway companies can now be purchased for an aggregate capital outlay of about £280.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1933-34	Week Ending	Traffic for Week		No. of Week	Aggregate Traffic to Date			Shares or Stock	Prices				
			Total this year	Inc. or Dec. compared with 1933		Totals		Increase or Decrease		Highest 1933	Lowest 1933	July 18, 1934	Yield % (New)	
						This Year	Last Year							
South & Central America.														
Antofagasta (Chili) & Bolivia	830	15.7.34	19,000	£	28	£ 371,070	£ 279,930	£	Ord. Stk.	26	114 $\frac{1}{4}$	21 $\frac{1}{2}$	Nil	
Argentine North Eastern ..	753	14.7.34	7,752	+	2	15,368	21,210	+	"	14 $\frac{1}{2}$	5	8	Nil	
Argentine Transandine ..	111	—	—	—	—	—	—	—	A. Deb.	55	40	50	8	
Bolivar	170	June, 1934	5,100	+	26	38,750	42,000	—	6 p.c. Db.	10	5	10	Nil	
Brazil	—	—	—	—	—	—	—	—	Bonds.	15	11	13	37 $\frac{1}{2}$	
Buenos Ayres & Pacific ..	2,806	14.7.34	71,273	—	2	141,474	186,734	—	Ord. Stk.	26	97 $\frac{1}{2}$	12	Nil	
Buenos Ayres Central ..	190	27.5.34	\$101,700	—	48	\$5,117,353	\$5,013,739	+	Mt. Db.	30	10	21	Nil	
Buenos Ayres Gt. Southern ..	5,085	14.7.34	109,002	—	2	230,440	362,803	—	Ord. Stk.	44 $\frac{1}{2}$	21 $\frac{1}{2}$	26	Nil	
Buenos Ayres Western ..	1,926	14.7.34	42,661	—	2	88,610	127,015	—	"	34 $\frac{1}{2}$	15 $\frac{1}{2}$	21	Nil	
Central Argentine	3,700	14.7.34	121,459	—	2	246,786	328,495	—	"	28 $\frac{1}{2}$	15	16	Nil	
Do.	—	—	—	—	—	—	—	—	Dfd.	18	10	8	Nil	
Cent. Uruguay of M. Video	273	14.7.34	13,113	—	2	28,619	32,009	—	Ord. Stk.	20	8	10 $\frac{1}{2}$	Nil	
Do. Eastern Extn. ..	311	14.7.34	2,800	+	2	5,546	5,493	+	—	—	—	—	—	
Do. Northern Extn. ..	185	14.7.34	1,785	—	2	3,580	4,106	—	—	—	—	—	—	
Do. Western Extn. ..	211	14.7.34	1,058	—	2	2,060	2,488	—	—	—	—	—	—	
Cordoba Central	1,218	14.7.34	34,810	—	2	70,910	86,790	—	Ord. Inc.	9 $\frac{1}{4}$	21 $\frac{1}{2}$	41 $\frac{1}{2}$	Nil	
Costa Rica	188	Apr. 1934	14,704	—	43	181,164	194,290	—	Stk.	29	20	29	69 $\frac{1}{2}$	
Dorada	70	June 1934	8,800	—	10	60,200	44,100	+	1 Mt. Db.	76 $\frac{1}{2}$	68 $\frac{1}{2}$	105	51 $\frac{1}{2}$	
Entre Rios	810	14.7.34	10,246	—	2	19,764	28,213	—	Ord. Stk.	26 $\frac{1}{2}$	9	13 $\frac{1}{2}$	Nil	
Great Western of Brazil ..	1,082	14.7.34	5,800	—	28	221,600	288,200	—	Ord. Sh.	23 $\frac{1}{6}$	1 $\frac{1}{2}$	9 $\frac{1}{2}$	Nil	
International of Cl. Amer.	794	May, 1934	\$475,123	—	21	\$2,466,673	\$2,282,410	+	\$184,263	"				
Interoceanic of Mexico ..	223 $\frac{1}{4}$	June, 1934	3,880	+	26	21,435	36,270	—	1st Pref.	1 $\frac{1}{2}$	1 $\frac{1}{6}$	1 $\frac{1}{2}$	Nil	
La Guaira & Caracas ..	1,918	14.7.34	26,287	+	28	611,699	639,522	—	Stk.	16	10	8 $\frac{1}{2}$	Nil	
Leopoldina	483	14.7.34	\$214,700	+	2	\$28,900	\$379,000	+	Ord. Stk.	20 $\frac{1}{4}$	10	8 $\frac{1}{2}$	Nil	
Midland of Uruguay ..	319	June, 1934	8,199	—	52	111,908	102,566	+	"	2	1	1 $\frac{1}{2}$	Nil	
Nitrato	401	15.7.34	7,619	+	28	146,283	62,635	+	Ord. Sh.	78 $\frac{1}{6}$	11 $\frac{1}{6}$	3	Nil	
Paraguay Central	274	7.7.34	4,360	+	1	4,360	4,180	+	Pr. Li. Stk.	72	49 $\frac{1}{2}$	72	85 $\frac{1}{2}$	
Peruvian Corporation ..	1,059	June, 1934	54,342	+	52	674,250	624,537	+	Pref.	15 $\frac{1}{4}$	5	11	Nil	
Salvador	100	7.7.34	\$12,250	+	27	\$12,250	\$14,700	+	Pr. Li. Db.	70	66 $\frac{1}{2}$	70	7 $\frac{1}{2}$	
San Paulo	153 $\frac{1}{2}$	8.7.34	31,736	-	27	832,395	829,067	+	Ord. Stk.	102	68	71	55 $\frac{1}{2}$	
Taita	1,365	June, 1934	5,800	+	52	69,895	44,295	+	Ord. Sh.	15 $\frac{1}{4}$	5 $\frac{1}{4}$	13 $\frac{1}{2}$	51 $\frac{1}{2}$	
United of Havana ..	1,365	14.7.34	15,292	+	22	33,003	30,839	+	"	8	2	3 $\frac{1}{2}$	Nil	
Uruguay Northern ..	73	June, 1934	978	+	35	13,533	16,440	—	Deb. Stk.	6	3 $\frac{1}{2}$	4 $\frac{1}{2}$	Nil	
Canada.														
Canadian National ..	23,748	7.7.34	605,539	+	27	16,504,888	14,073,976	+	—	—	—	—	—	
Canadian Northern ..	—	—	—	—	—	—	—	—	Perp. Dbs.	60 $\frac{1}{2}$	38	67	51 $\frac{1}{2}$	
Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	99 $\frac{1}{4}$	85	102 $\frac{1}{2}$	37 $\frac{1}{2}$	
Canadian Pacific ..	17,018	14.7.34	486,000	+	28	12,396,400	11,063,200	+	Ord. Stk.	22 $\frac{1}{2}$	11	14	Nil	
India.														
Assam Bengal	1,329	16.6.34	25,687	+	11	303,990	237,027	+	66,963	Ord. Stk.	79	70	79	31 $\frac{1}{2}$
Barsi Light	202	23.6.34	2,565	+	12	38,055	36,645	+	1,410	Ord. Sh.	101 $\frac{1}{2}$	70	100 $\frac{1}{2}$	6
Bengal & North Western ..	2,112	23.6.34	50,646	-	12	663,654	649,705	+	13,949	Ord. Stk.	292	240	273 $\frac{1}{2}$	57 $\frac{1}{2}$
Bengal Doonars & Extension	161	23.6.34	2,910	-	12	28,212	29,968	-	1,756	"	127	119	125	58 $\frac{1}{2}$
Bengal-Nagpur	3,269	16.6.34	114,225	+	11	1,342,650	1,183,669	+	158,981	"	97 $\frac{1}{4}$	83 $\frac{1}{2}$	101 $\frac{1}{2}$	31 $\frac{1}{2}$
Bombay, Baroda & Cl. India	3,089	7.7.34	133,800	+	14	2,336,550	2,246,550	+	90,000	"	112	107	109 $\frac{1}{2}$	51 $\frac{1}{2}$
Madras & South'n Mahratta	3,230	16.6.34	113,925	-	11	1,336,875	1,343,570	-	6,695	"	127	114 $\frac{1}{4}$	125 $\frac{1}{2}$	73 $\frac{1}{2}$
Rohilkund & Kumaon ..	546	23.6.34	9,302	-	12	130,772	129,119	+	1,653	"	260	225	249	6
South India	2,526	16.6.34	83,128	+	11	915,730	882,418	+	33,312	"	119 $\frac{1}{2}$	112	115 $\frac{1}{2}$	61 $\frac{1}{2}$
Various.														
Beira-Umtali	204	Apr., 1934	50,002	+	30	340,976	274,597	+	66,379	—	—	—	—	—
Bilbao River & Cantabrian	15	June, 1934	1,358	-	26	10,459	8,063	+	2,396	—	—	—	—	—
Egyptian Delta	621	30.6.34	5,078	+	109	47,103	45,931	+	1,172	Prf. Sh.	131 $\frac{3}{4}$	15 $\frac{1}{4}$	17 $\frac{1}{2}$	55 $\frac{1}{2}$
Great Southern of Spain ..	104	7.7.34	3,321	+	249	57,626	55,054	+	2,572	Inc. Deb.	4	3	3 $\frac{1}{2}$	Nil
Kenya & Uganda	1,625	Mar., 1934	240,520	+	12	638,137	606,192	+	31,945	"				
Manila	—	—	—	—	—	—	—	—	B. Deb.	53	33 $\frac{1}{2}$	42 $\frac{1}{2}$	81 $\frac{1}{2}$	—
Mashonaland	913	Apr., 1934	93,558	+	30	624,162	428,719	+	195,443	1 Mg. Db.	91 $\frac{1}{4}$	42	92 $\frac{1}{2}$	55 $\frac{1}{2}$
Midland of W. Australia ..	277	May, 1934	12,136	+	48	146,177	144,075	+	2,102	Inc. Deb.	89	70	97 $\frac{1}{2}$	41 $\frac{1}{2}$
Nigerian	1,903	19.5.34	27,584	+	7	190,762	168,221	+	22,541	"				—
Rhodesia	1,538	Apr., 1934	154,881	+	30	1,064,725	782,586	+	282,139	4 p.c. Db.	98 $\frac{1}{2}$	80 $\frac{1}{4}$	101	31 $\frac{1}{2}$
South African	13,180	23.6.34	523,130	+	12	5,754,265	4,994,530	+	759,735	"				—
Victorian	6,172	Apr., 1934	693,410	+	43	7,335,168	7,788,758	-	453,590	"				—
Zafra & Huelva	112	May, 1934	11,081	+	21	55,722	52,126	+	3,596	"				—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1%.

† Receipts are calculated @ 1s. 6d. to the rupee.

‡ as dividend. Salvador receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value.

Case No.

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